Australian Government
Civil Aviation Safety Authority

ADVISORY CIRCULAR
AC 101-01 v6.1

Remotely piloted aircraft systems - licensing and operations

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Acknowledgement of Country

The Civil Aviation Safety Authority (CASA) respectfully acknowledges the Traditional Custodians of the lands on which our offices are located and their continuing connection to land, water and community, and pays respect to Elders past, present and emerging.

Artwork: James Baban.

Advisory circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Advisory circulars should always be read in conjunction with the relevant regulations.

Audience

This advisory circular (AC) applies to:

- remotely piloted aircraft (RPA) operator's certificate (ReOC) holders and applicants
- remote pilots (RePL) and other remote crew members
- other support personnel involved in remotely piloted aircraft systems (RPAS) operations.

Purpose

This AC was developed by the Civil Aviation Safety Authority (CASA) to provide guidance to RPA operators, remote crew, manufacturers, and maintainers. It describes the categorisation of RPA and general requirements for use of RPAS. It also provides guidance to operators and crew on the safe and legal operation of RPA in all classes of airspace.

Although this AC may be of interest to all operators of remotely piloted aircraft, it is essential that operators of excluded RPA operate in accordance with the applicable regulations and read the guidance contained in the Micro and excluded RPA Plain English Guide. Model aircraft/ recreational operators please read and follow the guidance in AC 101-03.

Notice

It is essential that operators and crew involved in RPAS operations understand they are operating within the national aviation system and have an obligation to be aware of and follow, information and regulatory requirements relating to aviation operations. Such information includes, but is not limited to:

- Part 47 and 101 of the *Civil Aviation Safety Regulations 1998 (CASR)*
- requirements listed in the regulations table at section 1.3 of this AC
- AIP, ERSA, and aeronautical charts issued by Airservices Australia (AA).

For further information

For further information, or to clarify if proposed operations require a ReOC, contact CASA via the website.

Unless specified otherwise, all subregulations, regulations, Divisions, Subparts and Parts referenced in this AC are references to the *Civil Aviation Safety Regulations 1998 (CASR)*.

Status

This version of the AC is approved by the Branch Manager, Emerging Technologies and Regulatory Change.

Note: Changes made in the current version are annotated with change bars.

Table 1: Status

Version	Date	Details
v6.1	April 2026	Section 7 retitled, reordered and expanded upon to improve readability and add clarity for continuing airworthiness aspects, including for authorised maintenance personnel in support of the March 2026 amendment to CAO 100.24. Section 6.4 repositioned (registration and marking of large RPA was previously within Section 7, the content remains the unchanged). Advisory material references expanded to include AC 101-05. Instrument CASA 51/24 numbering updated from CASA 27/23.
v6.0	May 2024	Addition of Annex B to AC 101-01 - CASA Guidance - Applying for Approval to Conduct One to Many RPA Operations. Addition of military operating areas information and update of content and figures in Appendix A. Amendments to Annex A - CASA Guidance - Remote Pilot Licence (RePL) Training Course arising from the Part 101 Manual of Standards amendments commencing in 2024.
v5.1	October 2023	Amendments to Annex A - CASA Guidance - Remote Pilot Licence (RePL) Training Course arising from the Part 101 Manual of Standards amendments commencing in October 2023.
v5.0	July 2023	Re-ordered content to improve readability. Incorporated changes to the Part 101 MOS. Included non-controlled aerodrome approach and departure path guidance within Appendix A. Amended content relating to international operations to ensure consistency with international obligations. Amended content relating to BVLOS operations to reflect current CASA application review process.
v4.0	September 2022	Changes arising from the 2019 and later amendments to Part 101 of CASR, the issuing of the Part 101 Manual of Standards (and later amendments) and CASA Direction 22/22 and sundry editorial changes and clarifications.

Advisory circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Advisory circulars should always be read in conjunction with the relevant regulations.

Version	Date	Details
		Changes arising from amendments to the *Air Navigation (Aircraft Noise) Regulations 2018* and *Transport Safety Investigation Regulations 2021* in respect of Noise Approvals and reportable matters to the ATSB. Amendment to approach and departure diagrams for controlled aerodromes depicted in Appendix A to support revised diagram. Annex A is not being published as part of this new version and is currently under review.
v3.0	December 2019	New Annex A - Remote Pilot Licence (RePL) Training Course - CASA guidance added.
v2.1	July 2018	Removal of the approach and departure diagrams for non-controlled aerodromes. Changes to the dimensions of the approach and departure paths for controlled aerodromes depicted in Appendix A and several textual changes to support the revised diagram and to reflect the latest legislative instruments. Inclusion of advice relating to legislative instruments made in 2017.
v2.0	December 2016	This is the second AC to be published on this subject and replaces AC 101-1(0). This AC has been completely re-written to take into account amendments to Part 101 and to bring it up to date with current CASA procedures.
(0)	July 2002	Initial AC on this subject.

Unless specified otherwise, all subregulations, regulations, Divisions, Subparts and Parts referenced in this AC are references to the *Civil Aviation Safety Regulations 1998 (CASR)*.

Contents

1 Reference material

1.1 Acronyms

This AC describes the general requirements for non-recreational use of RPA. It is consistent with the work currently being developed by the International Civil Aviation Organization (ICAO) and that of other regulatory bodies; the terms and definitions are consistent with those used by ICAO as found in Annex 2, Rules of the Air, to the Convention on International Civil Aviation (the Chicago Convention).

The acronyms and abbreviations used in this AC are listed in the table below. Other acronyms in general use within the aviation industry can be found in the Aeronautical Information Publication (AIP) at General (GEN) 2.2. All operators, remote pilots and crew associated with RPA operations should familiarise themselves with that information.

Table 2: Acronyms

Acronym	Description
AC	advisory circular
ADF	Australian Defence Force
ADS-B	automatic dependent surveillance - broadcast
AIP	Aeronautical Information Publication
AIP-ENR	AIP – En Route (a section of AIP-Book)
AIP-ERSA	AIP – En Route Supplement Australia
AIP-GEN	AIP – General (a section of AIP-Book)
AA	Airservices Australia
AGL	above ground level
ANSP	air navigation service provider
AOC	air operator's certificate
ARN	aviation reference number
ATC	air traffic control
ATS	air traffic services
ATSB	Australian Transport Safety Bureau
BVLOS	beyond visual line of sight
CAO	Civil Aviation Order
CAR	*Civil Aviation Regulations 1988*
CASA	Civil Aviation Safety Authority
CASR	*Civil Aviation Safety Regulations 1998*
CofA	certificate of airworthiness
CRI	chief RePL instructor

Acronym	Description
CRP	chief remote pilot
CTAF	common traffic advisory frequency
DAMP	drug and alcohol management plan
DPP	documented practices and procedures
EC	electronic conspicuity
EVLOS	extended visual line of sight
FPV	first person view
FRE	flight radio endorsement
GCS	ground control station
HF	high frequency
HLS	helicopter landing site
ICAO	International Civil Aviation Organization
IREX	instrument rating exam
LAT	latitude
LONG	longitude
MC	maintenance controller
MOS	manual of standards
NAA	National Aviation Authority
NOF	NOTAM office
NOTAM	notice to airmen
OAR	Office of Airspace Regulation
OEM	original equipment manufacturer
ReOC	RPA operator's certificate
RePL[1]	remote pilot licence
RPAS	remote piloted aircraft system
RPS	remote pilot station
RTCA	radio technical commission for aeronautics
SOC	standard RPA operating conditions
SSR	secondary surveillance radar

[1] The acronym 'RePL' is used by CASA in its guidance and safety promotional materials to distinguish it from the conventional aviation recreational pilot licence (RPL) acronym. As such, a reference to an RPL training course in the Part 101 of CASR regulations should be read as a reference to a RePL training course.

Acronym	Description
TAC	terminal area chart
UHF	ultra-high frequency
VHF	very-high frequency
VLOS	visual line of sight
VNC	visual navigation chart
VTC	visual terminal chart
WAC	world aeronautical chart

1.2 Definitions

Terms that have specific meaning within this AC are defined in the table below. Where definitions from the civil aviation legislation have been reproduced for ease of reference, these are identified by 'grey shading'. Should there be a discrepancy between a definition given in this AC and the civil aviation legislation, the definition in the legislation prevails.

Table 3: Definitions

Term	Definition
aeronautical data originator	An organisation that can submit notice to airmen (NOTAM) information to Airservices Australia.
Australian flight information region	The region for which Australia provides flight information and search and rescue services.
beyond visual line of sight	An operation of a remotely piloted aircraft where the aircraft is not being operated in visual line of sight of the remote pilot.
command and control link	The data link between the remotely piloted aircraft and the remote pilot station for the purposes of managing the flight.
contracting State	A foreign country that is a party to the Chicago Convention.
controlled airspace	Airspace of defined dimension within which an air traffic control service is provided to flights in accordance with the airspace classification.
detect and avoid	The capability to see, sense or detect conflicting traffic or other hazards and take the appropriate action to comply with the applicable rules of flight.
excluded RPA	An RPA operated under prescribed conditions for commercial purposes that does not require a CASA authorisation in the form of an RPA operator's certificate (ReOC) and/or a remote pilot licence (RePL) in some circumstances (See regulation 101.237 of CASR for details).
extended visual line of site operation	An operation, available to approved operators and remote pilots only where, at times, the remote pilot does not have direct visual sight of the RPA; however, with assistance from trained RPA observers, the remote pilot is able to ensure safe operation of the RPA.
first person view	A visual method for controlling an RPA from the remote pilot station via an on-board camera.

Term	Definition
included RPA	A non-regulatory term for RPA operations that require authorisation in the form of a ReOC and RePL.
large RPA	An RPA (other than an airship) with a gross weight of more than 150 kg or a remotely piloted airship with an envelope capacity of more than 100 m3.
measurement point	Means any point on the actual or notional centreline of a runway between the 2 threshold centrepoints.
medium RPA	An RPA with a gross weight of more than 25 kg but not more than 150 kg or a remotely piloted airship with an envelope capacity of not more than 100 m3.
micro RPA	An RPA with a gross weight of not more than 250 g.
military operating area	An airspace of defined dimensions, with specified conditions, established for hazardous military activities.
model aircraft	A remotely piloted aircraft that is used for sport or recreational purposes and with a maximum gross weight of no more than 150 kg, or a remotely piloted aircraft used for certain educational, training or research purposes with a maximum gross weight of no more than 7 kg (see section 2.1 for an expanded definition).
movement area	Means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the aprons
no-fly zone of a controlled aerodrome	Any areas and airspace that are below 400 ft and: (a) within 3 NM, in any direction, from the measurement point of any runway of a controlled aerodrome; or (b) within the approach and departure paths referred to in section 4.05 (of the Part 101 MOS), whether or not they extend beyond 3 NM, in any direction, from the measurement point of any runway of the controlled aerodrome.
no-fly zone of a non-controlled aerodrome	Any areas and airspace that are: (a) within 3 NM, in any direction, from the measurement point of any runway of the non-controlled aerodrome; or (b) within the approach and departure paths referred to in section 9.06 (of the Part 101 MOS), whether or not they extend beyond 3 NM, in any direction, from the measurement point of any runway of the non-controlled aerodrome.
non-significant change	A change to the ReOC holder's process or procedures that is not a significant change.
operational control	The exercise of authority over the initiation, continuation, diversion, or termination of a flight in the interest of safety of the aircraft and the regularity and efficiency of the flight.
operator (the ReOC holder)	A person, organisation or enterprise engaged in, or offering to engage in, an RPAS operation.
outside controlled airspace	Airspace of defined dimensions within which an air traffic control separation service is not provided to pilots (Class G airspace).
pilot (verb)	To manipulate the flight controls of an aircraft during flight time.
relevant event	When a manned aircraft is within relevant airspace, including when the aircraft is in the course of approaching, landing at, taking off from, or manoeuvring on the movement area of, the aerodrome.
relevant airspace	Each of the following:

Term	Definition
	a. the no-fly zone of a non-controlled aerodrome b. the no-fly zone of an HLS.
remote crew member	A crew member charged with duties essential to the operation of a remotely piloted aircraft system during flight time.
remote pilot	The person who manipulates the flight controls of a remotely piloted aircraft, or who initiates and monitors the flight, and is responsible for its safe conduct during flight time.
remotely piloted	Controlling an aircraft from a pilot station that is not on board the aircraft.
remotely piloted aircraft	An aircraft where the pilot flying is not on board the aircraft. *Note: remotely piloted aircraft and RPA have different meanings.*
remotely piloted aircraft system	A set of configurable elements consisting of a remotely piloted aircraft, its associated remote pilot station (or stations), the required command and control links and any other system elements as may be required at any point during the operation of the aircraft.
remote pilot station	The station at which the remote pilot manages the flight of a remotely piloted aircraft.
RPA	A remotely piloted aircraft other than a balloon, a kite, or model aircraft. *Note: remotely piloted aircraft and RPA have different meanings.*
significant change	For a certified RPA operator, [a significant change] means: a. a change to any of the following: i the operator's nominated personnel ii the formal reporting lines for any managerial or operational position that reports directly to any of the nominated personnel iii the qualifications and experience which the operator requires the nominated personnel to have iv the responsibilities assigned by the operator to the nominated personnel v the operator's process for making changes to the documented practices and procedures vi the managerial or operational positions within the operator's organisation vii the types of RPA being operated by the operator b. a change to any of the following that does not maintain or improve, or is not likely to maintain or improve, aviation safety: i the documented practices and procedures for the conduct of RPA operations ii the training or checking conducted by the operator iii the documented practices and procedures for managing operational risk iv the documented practices and procedures for managing the risk of fatigue in the operator's personnel v the documented practices and procedures for managing RPA maintenance c. any change in relation to the operator that will likely result in the reissue of the operator's ReOC.

Term	Definition
small RPA	An RPA with a gross weight of more than 2 kg but not more than 25 kg.
threshold	For a runway, means the beginning of that portion of the runway usable for landing.
threshold centrepoints	For a runway, means the point on the threshold of the runway at which the centreline of the runway intersects (or would intersect if there were a centreline) the threshold.
very small RPA	An RPA with a gross weight of more than 250 g but not more than 2 kg.
visual line of sight	A remotely piloted aircraft operation in which the remote pilot operating the aircraft can continually see, orient, and navigate the aircraft to meet their separation and collision avoidance responsibilities, with or without corrective lenses, but without the use of binoculars, a telescope or other similar device.

1.3 References

Legislation

Legislation is available on the Federal Register of Legislation website https://www.legislation.gov.au/

Table 4: Legislation references

Document	Title
Primary	
Airspace Act 2007	
Airspace Regulations 2007	
Airspace Amendment (Danger Areas) Regulations 2023	
Civil Aviation Act 1988	
CASR 1998 - Dictionary	
Part 21 of CASR	Certification and airworthiness requirements for aircraft and parts
Part 47 of CASR	Registration of aircraft and related matters
Part 45 of CASR	Display of nationality marks, registration marks and aircraft registration identification plates
Part 61 of CASR	Flight crew licensing
Part 92 of CASR	Consignment and carriage of dangerous goods by air
Part 99 of CASR	Drug and alcohol management plans and testing
Part 101 of CASR	Unmanned aircraft and rockets
Part 117 of CASR	Representations and surveys

Document	Title
Regulation 2 of the *Civil Aviation Regulations 1988 (CAR)*	Interpretation
Part 4A of CAR	Maintenance
Regulation 42CA of CAR	Maintenance schedule—primary, intermediate, restricted, or limited category aircraft
Regulations 42CB of CAR	Maintenance—experimental aircraft
Air Navigation (Aircraft Noise) Regulations 2018	
Transport Safety Investigation Act 2003	
Transport Safety Investigation Regulations 2003	
Instruments	
CASA Instrument 01/17	*Approval – Operation of RPA at night*
CASA 22/22	Operation of Certain Unmanned Aircraft – Renewal of Directions Instrument 2022
CASA 23/23	Operation of Remotely Piloted Aircraft Within No-Fly Zone of a Controlled Aerodrome Approval 2023
CASA 51/24	*Remotely Piloted Aircraft Operations Beyond Visual Line of Sight Exemption 2024*
Civil Aviation Order (CAO) 20.18	Aircraft equipment – basic operational requirements Instrument 2014
Part 101 Manual of Standards	Unmanned aircraft and rockets
Part 172 Manual of Standards	Manual of Air Traffic Services
Other Legislation	
Environment Protection and Biodiversity Conservation Act 1999	
Privacy Act 1988	

Advisory material

CASA's advisory materials are available at https://www.casa.gov.au/publications-and-resources/guidance-materials

Table 5: Advisory material references

Document	Title
AC 21-10	Experimental Certificates
AC 21-13	Australian-designed aircraft - type certification
AC 91-23	ADS-B for enhancing situational awareness
AC 101-03	Unmanned aircraft and rockets – model aircraft
AC 101-05	Functions and duties of RPAS maintenance controllers
CAAP 92-2	Guidelines for the establishment and operation of onshore Helicopter Landing Sites

International Civil Aviation Organization documents

International Civil Aviation Organization (ICAO) documents are available for purchase from http://store1.icao.int/

Many ICAO documents are also available for reading, but not purchase or downloading, from the ICAO eLibrary (https://elibrary.icao.int/home).

Table 6: ICAO references

Document	Title
ICAO Document 10019	Manual on Remotely Piloted Aircraft Systems (RPAS)
Convention on International Civil Aviation (the Chicago Convention)	Article 8, Pilotless aircraft
Chicago Convention	Annex 2, Rules of the Air
Chicago Convention	Annex 8, Airworthiness of Aircraft

Other references

Table 7: Other references

Document	Title
CASA Office of Airspace Regulation (OAR)	OAR Operations Manual
CASR Part 101 Plain English Guide (PEG)	Micro and excluded Remotely Piloted Aircraft operations
En Route Supplement Australia (ERSA)	En Route Supplement Australia (ERSA) (http://www.airservicesaustralia.com/aip/aip.asp)
ISO 31000	Risk management

Document	Title
Radio Technical Commission for Aeronautics (RTCA) DO-320	Operational Services and Environmental Definition (OSED) for Unmanned Aircraft Systems
RTCA DO-304	Guidance Material and Considerations for Unmanned Aircraft Systems
https://www.casa.gov.au/operations-safety-and-travel/safety-advice/drug-and-alcohol-management/drug-and-alcohol-management-plans-damps	Drug and alcohol management plans (DAMPs)
https://www.casa.gov.au/safety-management	CASA safety management
www.oaic.gov.au	Office of the Australian Information Commissioner

1.4 Forms

CASA's forms are available at http://www.casa.gov.au/forms

Table 8: Forms

Form number	Title
Form 101-01	Remote Pilot Licence (RePL)
Form 101-02	Application for RPA Operator's Certificate (ReOC) (initial issue/variation/renewal)
Form 101-05	RePL Training - Notification of Results
Form 101-09	RPA Flight Authorisation
Form 1162	Aviation Reference Number (ARN) Application (Individuals)
Form 1170	Aviation Reference Number (ARN) Application (Organisations) RPAS Multi-purpose Form Application for Extended Visual Line-of-sight (EVLOS) Form RPAS ReOC - Significant Change Approval and/or Notification of Non-Significant Changes RPAS Tethering Operations - Approval of Practices and Procedures

Note: ARN and other applications can be made through the myCASA portal. See section Appendix B of this AC for advice.

2 Regulatory framework

2.1 Introduction

2.1.1 Operators of all civilian aircraft are operating within the national aviation system, including remotely piloted aircraft, and must operate their aircraft safely and in accordance with the relevant legislation that governs aircraft operations.

2.1.2 Remotely piloted aircraft operations may pose safety risks to other airspace users and to the people and property over which they fly. These risks must be kept at an acceptable level.

2.1.3 CASA manages the risk posed by remotely piloted aircraft operations through licencing, certification and operational rules. Different rules apply depending on the size of the aircraft and the operational profile.

2.1.4 In Australia, an RPA is a remotely piloted aircraft that is not a balloon, kite, or a model aircraft.

2.1.5 An RPA is part of a remotely piloted aircraft system (RPAS) which includes but is not limited to:

- the RPA
- a remote pilot station (RPS)
- the command and control (C2) data-link.

2.1.6 The difference between a model aircraft and an RPA is the purpose of the operation. Generally, a model aircraft is one that:

- has a gross weight of not more than 150 kg and is being operated for the purpose of sport or recreation

  or

- has a gross weight of not more than 7 kg and is being operated in connection with the educational, training or research purposes of a primary school, high school or university.[2]

2.1.7 Sport or recreational purposes means operating a remotely piloted aircraft as a hobby or for pleasure and where the operation does not generate a direct commercial outcome of any sort (for the pilot or any third party). Users of model aircraft can find specific guidance material contained in AC 101-03.

2.1.8 State aircraft and Australian Defence Force RPAs

2.1.8.1 Remotely piloted aircraft operated by the Australian Defence Force (ADF) are defined by the *Civil Aviation Act 1988 (the Act)* as ‘State aircraft’ and operate under Defence regulations. A ‘Regulator-to-Regulator’ agreement exists between CASA and the Defence Aviation Safety Authority (DASA) to ensure that both civil and Defence regulations move towards harmonisation.

2.1.8.2 The ADF will determine the issues relating to civil contractors and the Defence service and will exercise its own requirements, however, CASA’s standards are expected in the first instance.

2.1.8.3 In most circumstances, a civilian operator is required to hold a CASA approval for operations that are conducted for the ADF in Australian civil airspace.

2.1.8.4 Unless the remotely piloted aircraft is designated in writing to be a 'State aircraft' by the ADF, CASA will proceed on the basis that operation of the remotely piloted aircraft constitutes a civilian operation and requires the necessary CASA authorisations to first be obtained before any operations are undertaken.

[2] See CASR 101.023 for complete definition of model aircraft.

2.2 Types of RPA

2.2.1 RPA are divided into several categories:

- aeroplane
- helicopter (single-rotor class)
- helicopter (multi-rotor class)
- airship
- powered lift (hybrid aeroplanes with vertical take-off capability).

2.2.2 Within CASR, RPA are separated by weight into types, known as weight classes:

- **micro:** gross weight of not more than 250 g
- **very small:** gross weight of more than 250 g and not more than 2 kg
- **small:** gross weight of more than 2 kg and not more than 25 kg
- **medium:** gross weight of more than 25 kg and not more than 150 kg (or, for airships, an envelope of 100 m^3 or less)
- **large:** gross weight of more than 150 kg (or, for airships, more than a 100 m^3 envelope).

2.3 Types of RPA operations

2.3.1 Determination of type of operations

2.3.1.1 CASA acknowledges a ‘one-size-fits-all’ approach to RPAS policy and regulation is not always appropriate and has determined that RPA operations, when conducted under strict conditions only, present a low level of risk to other airspace users, other people, and property. CASA has determined that certain RPA, in particular circumstances, can be operated safely in Australian airspace within prescribed regulatory requirements.

2.3.1.2 For commercial RPA operators, there are three types of operations: operations with micro RPA, operations with excluded RPA,[3] and operations with included RPA. The level of operational risk generally associated with each type of RPA operation establishes the level of regulatory requirements.

2.3.1.3 The determination of the type of operation depends on the following criteria influencing the operational risk:

- gross weight of the RPA
- whether the flight is conducted within the standard RPA operating conditions (SOC). See section 2.3.3.

2.3.1.4 For some RPA weight categories, a flight that is compliant with the SOC is further assessed for:

- meeting training or experience rules
- compliance with the ‘landholder’ rules.

2.3.2 Included RPA operations

2.3.2.1 Included RPA operations are conducted under the privileges and in accordance with the conditions of an RPA operator's certificate (ReOC) issued to the operator. The ReOC process is a certification process for an organisation or a sole trader. A ReOC holder will have documented

[3] Excluded RPA operations are defined in regulation 101.237 of CASR.

practices and procedures (DPP) designed to assist risk mitigation for more complex operations, and as such, ReOC holders are subject to a higher level of regulatory oversight than excluded or micro RPA operators.

2.3.2.2 The ReOC may be issued to an individual or a legal entity, such as a company. Details of how to obtain a ReOC are contained in chapter 4 of this document.

2.3.2.3 A general overview of the rules that apply to ReOC operations are contained in chapter 3 of this document. A ReOC holder may apply for authorisations and area approvals to operate outside of the general rules or within areas not permitted for excluded or micro RPA.

2.3.2.4 Included operations must be piloted by a person holding an appropriate remote pilot licence (RePL). Details of how to obtain a RePL are contained in chapter 5.

Large RPA (more than 150 kg)

2.3.2.5 All operations involving a large RPA are 'included' operations, regardless of the purpose of the operation.

2.3.2.6 Large RPA are regulated by additional provisions for remotely piloted aircraft (Subpart 101.F of CASR). Operations of large RPA must be conducted under a ReOC (see chapter 4 for details of obtaining the operators certificate) and by pilots who hold a RePL (see chapter 5). The general operating conditions that apply to large RPA operated under a ReOC are described in chapter 3 and information about additional certification and registration requirements can be found in chapter 7.

2.3.2.7 CASA should be contacted for guidance before applying for authorisation to operate this type of RPA.

2.3.3 Excluded RPA operations

2.3.3.1 Excluded RPA operations are operations conducted in compliance with the standard RPA operating conditions (SOC - see 2.3.3.7) and are either:

- in RPA with a gross weight of not more than 2 kg (see 2.3.3.8).
- in RPA with a gross weight of not more than 150 kg and operated over the land owned or leased by the RPA owner (the 'landholder' rule) (see 2.3.3.11).
- in RPA with a gross weight of not more than 150 kg and operated solely for training or experience (see 2.3.3.13).

Note: There are rules that apply to excluded RPA operations in addition to the SOC.

2.3.3.2 If an RPA operation does not meet the criteria of an excluded RPA operation, it is an included operation and subject to the requirement of a ReOC and RePL (with the exception of micro RPA).

2.3.3.3 Excluded RPA operations are deemed low-risk and are excluded from the requirement to obtain full certification and licencing of both a ReOC and RePL, depending on the type of excluded RPA operations.

2.3.3.4 Specific guidance material relevant to excluded RPA operations is contained in the Part 101 Micro and Excluded RPA Plain English Guide.

2.3.3.5 ReOC holders may also conduct operations in the excluded category. These excluded operations are separate to, and cannot be conducted under, a ReOC as by definition they are excluded from the requirement for a ReOC. This means that excluded RPA operations neither receive the privileges of the ReOC or any other instruments the ReOC holder may hold, nor are they bound by any conditions placed upon the ReOC holder.

2.3.3.6 Where a ReOC holder conducts operations under the excluded category it should keep records that demonstrate the at the operations was an excluded operation. CASA will presume that any RPA operations conducted by a ReOC holder is an included RPA operation unless the operator has evidence to the contrary.

Standard RPA operating conditions

2.3.3.7 The standard RPA operating conditions (SOC) are unalterable rules that apply to all excluded RPA operations (see regulation 101.238 of CASR)[4]. The SOC require that:

- the RPA **is operated**:
  - only in Australian territory (including within 12 NM or 22 km of coastline)
  - within the visual line of sight (VLOS) of the person operating the RPA – the pilot must be able to see[5] the RPA at all times and be close enough to control it correctly in normal and emergency situations
  - no higher than 400 ft (120 m) above ground level
- the RPA **is not operated**:
  - closer than 30 m from people not associated with the flight[6]
  - in a prohibited area or restricted area
  - in a restricted area that is classified as RA3
  - over populous areas (see section 3.1.6.11 for definition of populous area)
  - within 3 NM (5.5 km) of the movement area of a controlled aerodrome – one with an operating control tower
  - in the area of a public safety operation without the approval of a person in charge of the operation
- **only 1 RPA** flown per pilot at any one time.

Excluded operations with very small RPA (more than 250 grams, up to 2 kg)

2.3.3.8 A ReOC and RePL are not required when using very small RPA under the SOC and in accordance with Subpart 101.G of CASR. The risks associated with remote aircraft of this type have been determined to be low and they are therefore treated as excluded RPA operations.

Excluded operations in RPA weighing more than 2kg as a landholder

2.3.3.9 Operations conducted in RPA over 2 kg over land owned or leased by the RPA owner may fall into a subset of the excluded category known as the landholder excluded category.

2.3.3.10 For small RPA (more than 2 kg, not more than 25 kg) operating in the landholder excluded category, there is no requirement for a ReOC or RePL.

2.3.3.11 Medium RPA (more than 25 kg, not more than 150 kg) operating in the landholder excluded category, there is no requirement for a ReOC. However, there is a requirement to obtain a remote pilot licence (RePL) for the intended type and model of RPA.

2.3.3.12 The ‘landholder rule’ requires that the operation be compliant with all of the following:

[4] Excluded RPA are subject to additional regulatory requirements detailed in the regulations.

[5] Visual line of sight must not depend upon binoculars or telescopes, however, vision correction by glasses or contact lenses is permitted.

[6] Any person who is not charged with duties essential to the safe operation of an RPA.

- the remote pilot is the owner of the RPA or is a person operating the aircraft on the RPA owner's behalf
- the RPA is being operated over the owner's property or property leased by the owner
- the RPA is being used for activities defined in regulation 101.237 of CASR:
  - aerial spotting
  - aerial photography
  - agricultural operations (e.g., weed spraying, pest spraying, fertiliser application, seed broadcasting or application of other substances for agricultural purposes)[7]
  - aerial communications re-transmission
  - carriage of cargo
  - any other activity similar to those listed above
- the remote pilot/owner of the RPA or the owner/leaseholder of the land do not receive direct reward or compensation for the operation.

Excluded operations in RPA weighing more than 2kg for training or experience

2.3.3.13 Certain training and experience building operations can be conducted under the excluded category.

2.3.3.14 For small RPA (more than 2 kg, not more than 25 kg) operated for the purposes of gaining the experience needed to meet the 5-hour minimum experience requirement for the grant of an initial RePL or gaining practical experience and competency in the operation of an RPA not specified in their RePL, there is no requirement for a ReOC or RePL.

2.3.3.15 CASA has issued an exemption to facilitate experience building flights on medium RPA without a ReOC or coverage of the particular aircraft on the pilot's RePL. Flight conducted under the exemption do not fall into the excluded category; however, the SOC apply. Pilots seeking to build experience in medium RPA should review the conditions of the exemption.[8]

2.3.4 Micro RPA operations (less than 250 grams)

2.3.4.1 Micro RPA operations are categorised as a standalone class, requiring neither a ReOC nor RePL. They are, nonetheless, subject to the general rules regarding RPA operations (CASR subparts 101.A to C, Part 101 MOS chapter 4 and 9, Direction 22/22).

2.3.4.2 Specific guidance material relevant to micro operations is contained in the CASR Part 101 Micro and Excluded RPA Plain English Guide.

2.3.4.3 Micro RPA cannot presently be operated under a ReOC.

2.3.4.4 Operators of micro RPA may apply to CASA for flight authorisations, such as BVLOS.

WARNING

Unauthorised persons operating RPA outside of the conditions applicable to excluded RPA are in breach of the law and may be subject to enforcement action by CASA.

[7] State/Territory environmental protection legislation applies.

[8] See CASA EX91/23

3 RPA operations

3.1 Flight rules

3.1.1 Overview

3.1.1.1 This chapter outlines the RPA flight rules that generally apply to included operations.

3.1.1.2 The main difference between excluded and included operations is that ReOC holders can apply to CASA for authorisation to operate outside of the general rules for included operations.

3.1.2 Height limitations

3.1.2.1 RPA are limited to a height of 400 ft (120 m) above ground level[9], that is, above the point on the surface of the water or earth directly below the RPA.

3.1.2.2 Where the surface of the earth has been altered (e.g. by mining operations), the measurement point is the current surface of the earth (e.g. the bottom of a mining pit, not the natural surface).

3.1.2.3 Where there is an object on the surface of the earth (e.g. a office tower), the measurement point remains the surface of the earth (the base of the object).

3.1.2.4 Further height limitations apply near aerodromes (see section 3.1.3).

3.1.2.5 Included operators may apply to CASA to operate above 400 ft AGL using Form 101-09.

3.1.2.6 Operations above 400 ft AGL may increase the chance of conflict with other airspace users. CASA expects that an application for operations above 400 ft AGL will include a review of local aviation traffic and implementation of appropriate mitigators.

3.1.2.7 Operators should be aware of the potential increased ground hazard area of the RPA when operating at heights. For example, strong winds will increase the horizontal distance the RPA travels if it were to fail.

3.1.3 Operating near or over aerodromes

3.1.3.1 Section 3 of the Civil Aviation Act 1988 defines an aerodrome to mean: an area of land or water (including any buildings, installations and equipment), the use of which as an aerodrome is authorised under the regulations, being such an area intended for use wholly or partly for the arrival, departure or movement of aircraft.

3.1.3.2 Locations of all certified aerodromes and many uncertified aerodromes are marked on aeronautical charts, with further details on the aerodrome in ERSA. Aerodromes areas are also displayed on CASA-verified drone safety apps.

3.1.3.3 As not all aerodromes are marked on aeronautical charts, and some aerodromes do not appear in ERSA, operators should check using satellite pictures or seek local knowledge to identify any nearby aerodromes.

3.1.3.4 Aerodromes with an active air traffic control tower are known as controlled aerodromes. The air traffic control tower at some towered aerodromes are not staffed at all times. An aerodrome without an air traffic control tower or with an air traffic control tower that is not staffed is known as a non-controlled aerodrome.

3.1.3.5 An aerodrome intended to be used wholly by helicopters is known as a helicopter landing site or HLS.

[9] In accordance with regulation 101.085 of CASR

3.1.3.6 All aerodromes have no-fly zones where RPA are generally prohibited. The specific no-fly zone will depend on if the aerodrome is controlled and if the aerodrome has runways or a HLS.

3.1.3.7 Details of the no-fly zones and approach and departure paths for each aerodrome type is included in Appendix A.

Operations in the no-fly zone of non-controlled aerodromes (including HLS)

3.1.3.8 Operations in the no-fly zone of a non-controlled aerodrome are permitted when there is not a relevant event occurring. A relevant event is any time a crewed aircraft is within relevant airspace, including when the aircraft is in the course of approaching, landing at, taking off from, or manoeuvring on the movement area of, the aerodrome.

3.1.3.9 If the remote pilot becomes aware that a relevant event is occurring, or is about to occur, the remote pilot must not launch the RPA. If the RPA is already airborne, the remote pilot must safely manoeuvre the RPA away from the path of the crewed aircraft and land the RPA as soon as safely possible.

3.1.3.10 Included operations in the no-fly zone of a non-controlled aerodrome during a relevant event are permitted without CASA approval where:

a. the operation is exclusively an indoors operation as defined in Section 1.04 of the Part 101 MOS; or

b. the operation is a tethered operation that meets the requirements of Section 9.05 of the Part 101 MOS.

3.1.3.11 Operators conducting operations within the no-fly zone are expected to have appropriate content in their DPP detailing the procedures and risk mitigators.

3.1.3.12 Operations during a relevant event that are not a tethered operation or an indoors operations (see section 3.1.3.10) require specific CASA approval. The application should be made using Form 101-09, ensuring all documentation as requested within the form is supplied. For these operations, CASA expects that the applicant has liaised with the aerodrome operator and have identified suitable mitigations to reduce the risk of potential conflicts with other aircraft.

Operations in the no-fly zone of controlled aerodromes

3.1.3.13 RPA operations within the no-fly zone of a controlled aerodrome require approval from CASA and the relevant air navigation service provider (ANSP). There are two ANSPs in Australia, Airservices Australia (AA)) who control civilian airspace, and the Department of Defence (Defence) who control military airspace.

3.1.3.14 To obtain approval to operate in the no-fly zone, operators will need to have suitable procedures in their DPP, and pilots will need to have the relevant training certification from the ReOC holder.

3.1.3.15 Advice on any performance requirements or limitations unique to the RPA should be provided as part of the application.

Civilian controlled aerodromes

3.1.3.16 For AA controlled aerodromes, applications are to be made to CASA, who will liaise with AA to identify if the operation may proceed as applied for. The initial application should be made using Form 101-09, ensuring all documentation as requested within the form is supplied. It is recommended that operators submit these applications at least 60 days before the planned operation to allow enough time for the application to be processed. If the application is complex, more time should be allowed.

3.1.3.17 There are a number of controlled aerodromes that are undergoing an automated airspace approval trial. Operators taking part in the trial apply to operate in the no-fly zone via a drone safety app and are provided near real-time notification of approval. Form 101-09 does not apply to flights under the automated airspace authorisations trial. More information about how to

participate in the trial can be found on the 'automated airspace authorisations trial' CASA webpage. Operations in the no-fly zone above 400 ft are not permitted through the automated airspace authorisation trial and applications must be made to CASA.

Military controlled aerodromes

3.1.3.18 For Defence controlled aerodromes, applications are made directly to Defence unless the operation is also above 400 ft AGL. Contact details of the relevant air traffic control unit are contained in ERSA. CASA has published instrument of approval CASA 23/23, which applies in relation to a ReOC holder operating an RPA within the no-fly zone of a military controlled aerodrome, and provides the CASA component of an approval to operate in the no-fly zone where the conditions of the instrument are met. Operations in the no-fly zone above 400 ft AGL require specific CASA approval. The initial application should be made using Form 101-09, ensuring all documentation as requested within the form is supplied.

Abnormal operations

3.1.3.19 Specific flight termination procedures developed by the ReOC holder and executed by the remote pilot should be agreed with ANSP before undertaking the operation. At a minimum, the following information should be briefed:

- pre-programmed loss-of-C2 link flight profile-including actions to take should the control link not be re-established within an agreed timeframe
- flight termination capabilities
- RPA performance under termination conditions.

3.1.3.20 RPA should not be operated within controlled airspace without an operable flight failsafe system, such as one that provides automated recovery to a predetermined recovery area.

3.1.3.21 In the event of communications failure between the remote pilot and the ANSP, the remote pilot must follow the conditions of the approval in relation to this failure, or the documented procedures of the certified operator, until such time the communication link is re-established.

Coordinating with ANSP

3.1.3.22 If a person is using an aeronautical radio to communicate with the ANSP, the certified operator must ensure that person holds a relevant qualification in accordance with regulation 101.285 of CASR. Where agreed with the ANSP, mobile telephone or other means may be used.

3.1.3.23 Communication requirements may be prescribed within the documented practices and procedures or conditions on the approval. The remote pilot should ensure they understand the communication requirements when operating under the approval.

Position reporting

3.1.3.24 Position reporting to the ANSP must be conducted on request from the ANSP or other air users and in accordance with ENR 1.1-101.

Flight deviations

3.1.3.25 Requests for deviations from the approved area of operation will require further assessment and reissue of the approval. Deviations outside the approved area cannot occur dynamically during the operation.

RPA operations outside of tower hours

3.1.3.26 Outside tower hours, controlled aerodromes are treated as non-controlled aerodromes and the prescribed requirements in Chapter 9 of the Part 101 MOS must be adhered to. Tower hours and procedures are listed in AIP ERSA and may be amended by NOTAM (see section 3.3.2). There are some towers that are controlled 24 hours a day, 7 days a week.

Operations from security controlled aerodromes

3.1.3.27 If operations are planned from a security-controlled aerodrome, operators should consider the requirements for access to operational areas and the aviation security requirements that apply to security-controlled aerodromes.[10]

3.1.4 Prohibited, restricted and military operating areas

3.1.4.1 These are temporary and permanent prescribed areas of airspace in which flight is not permitted unless express permission is obtained from the controlling or administering authority for that area.

3.1.4.2 There are no permanently prohibited areas in Australia. Where a temporary prohibited area is established the details of the area will be notified by notices to airmen (NOTAM) (see section 3.3.2). Excluded operations cannot obtain permission to operate in prohibited areas. It is unlikely that an included RPA operation would be approved in a prohibited area unless the operation is directly related to the purpose of the prohibited area.

3.1.4.3 Australia has a significant number of permanent restricted areas. The locations of permanent restricted areas are marked on aeronautical charts and contact details for controlling authorities are published in ERSA.

3.1.4.4 Temporary restricted areas are created where there is a localised area of heightened aviation activity or airspace risk. Details of temporary restricted area are published in NOTAM (see section 3.3.2).

1.1.1.1 Restricted areas have three categories, RA1, RA2 and RA3. The category of the restricted area is published in ERSA (for permanent areas) or AIP SUP (for temporary areas). Excluded operations cannot obtain permission to operate in RA3 restricted areas.

3.1.4.5 Permission to operate in a prohibited, restricted or military operating area should be sought from the controlling or administering authority of the area. Approved operations will be subject to any conditions imposed by the controlling or administering authority. Failure to comply with the conditions is a failure to comply with the regulations.

3.1.4.6 The CASA-verified drone safety apps also display prohibited, restricted and military operating areas, including temporary areas.

3.1.5 Operating in controlled airspace

3.1.5.1 RPA may be operated in controlled airspace below 400 ft AGL without CASA approval, provided the operation is not in the no-fly zone of an aerodrome (see section 3.1.3).

3.1.5.2 If the RPA weighs over 2 kg, additional aeronautical radio requirements apply (see section 3.3.4)

3.1.6 Operating near people and in populous areas

Minimum distance from people

3.1.6.1 RPA generally cannot be operated within 30 m of a person unless the person has duties essential to the control and navigation of the RPA.

3.1.6.2 The minimum distance from people is measured both from the RPA, and from the point on the ground directly below the RPA.

[10] For further information, refer to the Department of Home Affairs.

3.1.6.3 ReOC holders may operate closer than 30 m to a person, but not closer than 15 m, where the person has provided consent.[11] Prior to obtaining consent the person should be briefed on the risks associated with proximity to the RPA flight.

3.1.6.4 ReOC holders have an obligation to ensure the RPA operation does not cause a hazard to a person and should always reduce any risk to as low as reasonably practicable. Prior to operating within 30 m of a person a risk assessment should be completed and any necessary mitigators implemented to ensure the RPA does not cause a hazard. Operators should consider the capabilities and limitations of the RPA platform as part of the risk assessment, including position holding, obstacle avoidance and failsafe systems.

3.1.6.5 Operations closer than 15 m to a person require CASA authorisation under regulation 101.245 and an exemption from the requirements of regulation 101.280 of CASR.

3.1.6.6 Dependent on the level of risk, CASA has identified a number of application pathways to operate an RPA over or near people. Refer to Flying near people on the CASA website for more information.

3.1.6.7 Applications should be submitted to RPAS.PAC@casa.gov.au using the RPAS multi-purpose form, accompanied by supporting documentation.

3.1.6.8 CASA expects that an application to operate closer than 30 m will include a rigorous risk assessment and implementation of mitigations assigned to each additional risk posed by RPA operations close to persons.

Populous areas

3.1.6.9 Operations are also prohibited over a populous area unless conducted at an altitude that would prevent the RPA injuring people or damaging property in the event of an aircraft or system failure.[12] Failures are not limited to propulsion systems, and include, for example, a failure of a structural component of the RPA.

3.1.6.10 The populous area rule applies even where the operator meets the minimum distance from people rule.

3.1.6.11 A populous area is defined as:

> an area in relation to the operation of an unmanned aircraft that has a sufficient density of population for some aspect of the operation, or some event that might happen during the operation (in particular, a fault in, or failure of, the unmanned aircraft) to pose an unreasonable risk to the life, safety, or property of somebody who is in the area but is not connected with the operation.[13]

3.1.6.12 For example, if a multirotor RPA is flying at a relatively low height (i.e., 100 ft) directly above a single person not associated with the flight, it may be considered to be operating in a populous area due to the fact that a complete loss of power may cause injury to the person below. This interpretation would apply equally to higher flight over small or large public gatherings, or over built-up areas where there is a greater risk to property.

3.1.6.13 It is the responsibility of remote pilots operating RPA to ensure the flight does not take place unless it is compliant with the 'populous area' rule and to take sufficient precautions when operating in the vicinity of people and property.

3.1.6.14 An area within an urban environment may be deemed as 'non-populous' for the duration of an RPA operation if certain conditions are met. For example, an oval devoid of people could be used to photograph real estate from across the road using oblique photography; or the area around a power pole within an urban area, set up as a demarcation zone with appropriate 'temporary workplace' signage may be used. It is the operator's responsibility to ensure that any

[11] In accordance with regulation 101.245 of CASR.

[12] In accordance with regulation 101.280 of CASR.

[13] In accordance with regulation 101.025 of CASR.

demarcation zone is suitably placarded, and an observer is in place to ensure that there are no encroachments on that area.

3.1.6.15 ReOC holders may apply to CASA for an exemption to operate over a populous area or, if the RPAS is certified, an approval to operate over a populous area. CASA will only issue an authorisation to operate over a populous area where the applicant can demonstrate that the operations will not result in an unacceptable level of risk to persons or property on the ground.

3.1.7 Visual line of sight

3.1.7.1 Unless otherwise approved by CASA, the remote pilot must maintain visual line of sight (VLOS) with the RPA at all times during flight[14].

3.1.7.2 An RPA is being operated within the visual line of sight of the person operating the aircraft if the person can continually see, orient and navigate the aircraft to meet the person's separation and collision avoidance responsibilities, with or without corrective lenses, but without the use of binoculars, a telescope or other similar device.

3.1.7.3 The VLOS rule is more than a distance restriction. The requirement to be able to continually see the RPA requires that the remote pilot can maintain positive control. An RPA cannot be operated behind an object that obscures the remote pilot's view of the RPA.

3.1.7.4 Electronic aids, such as on-screen or moving map displays, can be beneficial to improving situational awareness of the local environment for the remote pilot and, where available, may be used as risk mitigation tools. Such displays may be used as an additional aid to safety, but cannot be used instead of, or to replace, direct eye contact in VLOS operations.

3.1.7.5 ReOC holders may apply to CASA for authorisation to operate outside of the remote pilot's VLOS, as either an extended visual line of sight (EVLOS) or a beyond visual line of sight (BVLOS) operation.

EVLOS Extended visual line of sight operations

3.1.7.6 Extended visual line of sight (EVLOS) is an operational category in which the remote pilot does not have direct visual sight of the RPA at all times. However, with assistance from trained RPA observers (persons who demonstrate competency via the operator’s approved training requirements), the remote pilot is still able to ensure safe operation of the RPA.

3.1.7.7 EVLOS operations are conducted in accordance with Chapter 5 of the Part 101 MOS. To conduct EVLOS operations, the ReOC holder requires an instrument of approval from CASA.

3.1.7.8 In EVLOS operations, at least one of the RPA observers must know the exact position of the RPA and have direct visual sight of the airspace around the RPA so they can assist the remote pilot to meet their collision avoidance responsibilities.

3.1.7.9 RPA observers are to alert the remote pilot to any incoming traffic, and the remote pilot is to take the necessary actions to manage the flight and avoid collisions.

3.1.7.10 There are two classes of EVLOS operations, Class 1, which requires the remote pilot and observer to be co-located, and Class 2, which permits the pilot and observer(s) to be separated.

3.1.7.11 Applications for EVLOS approval must be submitted to CASA using the Application for extended visual line-of-sight (EVLOS) form and be accompanied by procedures that meet the requirements of Chapter 5 of the Part 101 MOS and adequately mitigate the additional risks related to operations outside of VLOS. CASA has created an Annex to the RPAS industry sample operations manual with sample EVLOS procedures which may be appropriate.

[14] In accordance with regulation 101.073 of CASR.

3.1.7.12 EVLOS operations Class 1 and Class 2 do not require remote pilots to hold a pass in an instrument rating examination (IREX).[15]

Electronic aids

3.1.7.13 Electronic aids, such as on-screen or moving map displays, may be used in EVLOS operations to determine the location of the RPA. Prior to using electronic aids, the operator should consider any human factors or technological limitation in the system that may negatively impact the safety of operations.

First person view

3.1.7.14 First person view (FPV) may be used in EVLOS operations as an aid to obstacle avoidance. The RPA observer must be able to see the airspace around the RPA and have situational awareness of the ground beneath to ensure that the operation remains compliant with the regulations.

Beyond visual line of sight operations

3.1.7.15 Beyond visual line of sight (BVLOS) is an operational category in which the remote pilot does not have direct visual sight of the RPA. BVLOS operations are not routinely permitted. To fly beyond visual line of sight, an approval from CASA is required.

3.1.7.16 To operate BVLOS, there are also requirements for the remote pilot who must:

- obtain a pass in the Instrument Rating or BVLOS exam

  or

- operate under the direct supervision of an individual who holds a pass in one of the exams (see CASA EX51/24).

3.1.7.17 CASA has developed a suite of standard scenarios that may be used to apply for BVLOS operations with the following characteristics:

- near a vertical object over a controlled ground environment that only involves active participants (AU-STS 1)
- near a vertical object over a sparsely populated ground environment (AU-STS 2)
- in a remote area within three nautical miles of a registered or certified non-controlled aerodrome (AU-STS 4)
- below 400 feet AGL in remote Australian airspace, that is defined by CASA as locations with very low population density and low risk of aircraft encounters (AU-STS 6)
- above 400 feet AGL and up to 5000 feet AMSL in remote Australian airspace, that is defined by CASA as locations with very low population density and low risk of aircraft encounters (AU-STS 7).

For applications that meet the operational characteristics of one of the scenarios above, operators may apply using the standard scenario applicant response found at Apply for beyond visual line-of-sight approvals | Civil Aviation Safety Authority (casa.gov.au).

3.1.7.18 For BVLOS operations that do not fit the standard scenario models, BVLOS applications are assessed using the Specific Operations Risk Assessment (SORA) methodology.

3.1.7.19 SORA is a comprehensive risk assessment process that considers the air and ground risk factors to determine the level of risk associated with the operation. SORA was developed by the Joint Authorities for Rulemaking on Unmanned Systems (JARUS) and was adopted by CASA in 2017. The JARUS website provides detailed information and documentation on the SORA

[15] See CASA EX51/24.

process. Training courses for the SORA process are also provided by a number of organisations and may be helpful to operators seeking to submit a BVLOS application.

3.1.7.20 Applicants will need to provide a Concept of Operations (ConOps) summary describing the RPAS systems and the type of operations to be conducted. Applicants are also required to demonstrate how the proposed operation can be mitigated to an acceptable level of safety; among other elements of the operation, particular consideration should be given to:

- ground risk to people, property, and infrastructure
- air risk to other users in the area of operation and adjacent airspace
- aircraft control link and redundancy
- fail-safe systems
- collision risk mitigation
- navigation accuracy
- altitude accuracy
- stakeholder engagement for other relevant air users
- whether any technical solutions or procedures have been certified/assessed by the manufacturer of the RPA to meet design assurance requirements.

3.1.7.21 CASA may apply conditions to an approval for BVLOS operations, and all flights must be conducted in accordance with the conditions specified in the approval.

3.1.7.22 CASA's Office of Airspace Regulation (OAR) may be required to review the application if there is residual air risk present. An airspace solution may be required and the process for this is outlined at paragraph 3.2.3.

Equipment requirements

3.1.7.23 CASA may require the following equipment to be fitted to the RPA and operable for a BVLOS flight[16]:

- **position lights** (navigation lights)[17] - should be always turned on, while the RPA is in motion (including taxi, launch, flight, and recovery).
- **anti-collision or strobe lights** - should be always turned on when the RPA is in flight (unless otherwise directed by CASA or ATS).
- **landing lights** - should be turned on during recovery (if fitted).
- **transponders** - an approved SSR transponder or ADS-B out unit may be required (Some flights below 400 ft/120 m may be exempt). Subsection 9C of CAO 20.18 specifies the standards for Mode S transponder equipment. The transponder should be always switched to ON/ALT while the RPA is airborne. See section 3.3.5 for requirements relating to use of transponders.
- **aeronautical radio** - RPA communication equipment should allow the remote pilot to have direct communications with ATS and other airspace users, regardless of the aircraft's location. The normal published aeronautical very high frequencies should be used for communications with ATS.

[16] In accordance with regulations 101.073 and 101.300 of CASR.

[17] Position, anti-collision, strobe and landings lights, where required, should be demonstrably effective, but do not have to meet the standards of manned aircraft.

- **navigation equipment** - the RPA should have the navigation capability to comply with the tracking requirements of the airspace classification in which the RPA is being operated, and an acceptable level of design assurance.
- **any additional equipment** that the operator has included in its safety case for the approval of the operation.

Note: FPV is not an acceptable solution for visually separating RPAS from other airspace users in a safety case for approval of beyond visual line of sight (BVLOS) operations.

3.1.8 Operating at night

3.1.8.1 Unless otherwise approved by CASA, RPA must not be operated at night.

3.1.8.2 Night means the period between the end of evening civil twilight and the beginning of the following morning civil twilight.

3.1.8.3 CASA has issued a night approval to all ReOC holders which permits operation at night in accordance with the prescribed night requirements and procedures in the sample RPA Operations Manual and the CASA instrument (CASA 01/17 Approval - operation of RPA at night).

3.1.8.4 The instrument includes conditions requiring the operator have procedures in its DPP that are acceptable to CASA.

3.1.8.5 The night procedures contained in the RPAS sample operations manual are deemed to be satisfactory and an operator who includes the template procedures and a copy of the instrument in its DPP does not require further CASA approval.

3.1.8.6 An operator who wishes to operate under procedures that differ from those in the RPAS sample operations manual can apply to CASA for approval of the alternate procedures.

3.1.8.7 Where the alternate procedures fit within the condition of CASA 01/17, the approval can be obtained through the DPP significant change process (see section 4.8).

3.1.8.8 Where an operator wants to operator at night outside of the conditions of CASA 01/17 or for large RPA, the operator may apply to CASA for an alternative night approval using the RPAS multi-purpose form.

3.1.8.9 Operations at night reduce the pilot's situational awareness. An operator requesting an alternative approval will need to address how it will mitigate the additional risks.

3.1.9 Adverse meteorological conditions

3.1.9.1 Unless otherwise approved by CASA, an RPA must not be operated in cloud or where there is insufficient visibility to ensure the RPA operations do not create a hazard.

3.1.9.2 ReOC holders may apply to CASA to operate in adverse meteorological conditions using the RPAS multi-purpose form.

3.1.9.3 Atmospheric visibility is an important component in airspace traffic avoidance. An application to operate in adverse meteorological conditions should include details of how the operator intends to mitigate the potential increased airspace risks inherent in lower visibility.

3.1.9.4 Meteorological conditions may have an impact on the pilot's ability to maintain VLOS. Operations in adverse conditions that do not facilitate VLOS will also require a BVLOS approval.

3.1.10 Operating multiple RPA simultaneously

3.1.10.1 Unless otherwise approved by CASA, a pilot is not permitted to operate more than one RPA at a time (e.g. lightshow swarm or multiple RPA agricultural spraying).

3.1.10.2 ReOC holders may apply to CASA for an authorisation to permit the pilot to operate multiple RPA simultaneously (one to many operations).

3.1.10.3 An application for a one to many operation will need to include DPP with sufficient detail to address the technological and human factors complexities in having a single pilot control multiple RPA, including during abnormal operations. Applications should be submitted to CASA on the RPAS multi-purpose form.

3.1.10.4 For more information on applying for a one-to-many approval, refer to Annex B to AC 101-01 - CASA Guidance - Applying for Approval to Conduct One To Many Operations.

3.1.11 Operating near public safety operations

3.1.11.1 RPA must not be operated in the vicinity of a fire, police or other public safety or emergency operation (e.g., bush fires, traffic accidents, search and rescue) unless approval has been obtained from the person in charge of the operation[18].

3.1.11.2 Generally, approval will only be granted to persons with a duty related to the public safety or emergency operation.

3.1.12 Autonomous operations

3.1.12.1 While there are various degrees of automation in RPAS, an autonomous operation is one in which there is no ability for the pilot to intervene in the conduct of the flight. Systems such as a pre-programmed flight or an automated 'return to home' are features of automation and typically not considered 'autonomous' operations.

3.1.12.2 For the foreseeable future the remote pilot's functions and responsibilities are considered essential to the safe and predictable operation of the aircraft as it interacts with other aircraft and the air traffic management system.

3.1.12.3 ReOC holders wishing to obtain an authorisation to conduct autonomous operations are encouraged to contact CASA prior to submitting an application.

3.1.13 Dropping, discharging, and dispensing operations

3.1.13.1 Australian state and local government regulatory requirements should be met for the dropping or dispensing of chemicals or other materials. Local jurisdictions issue their own chemical application licences to cover these activities. It is the responsibility of the operator to ensure that the appropriate approvals are obtained from local authorities before conducting such operations.

3.1.13.2 To be satisfied that the operator can carry out the proposed operations safely, suitable procedures will need to be included in the company operations manual for CASA to approve.[19]

3.1.13.3 While dropping and discharging operations are generally permitted, these operations may present a heightened risk to other people, property or other aircraft. The operations must ensure that the operation does not create an unreasonable hazard. Remote pilots conducting dropping, discharging, or dispensing operations should have sufficient flight experience under supervision in such operations prior to any solo operations.

3.1.14 Creating a hazard

3.1.14.1 There is a general prohibition from operating an RPA in a way that creates a hazard to another aircraft, another person, or property.

[18] Refer to CASA EX22/22.

[19] In accordance with regulation 101.090 of CASR.

3.1.14.2 The operator does not need to have intended to create a hazard to contravene the hazardous operation rule.

3.1.14.3 The following are examples of the types of conduct that may be contravene the hazardous operation rule include:

- flying an RPA at speed directly toward a person or their property
- flying close to another aircraft in a dangerous manner
- flying in weather unsuitable for the aircraft or operation.

3.1.14.4 The regulations do not empower CASA to approve a hazardous operation.

3.1.15 Carriage of dangerous goods

3.1.15.1 The rules relating to carriage of dangerous goods by aircraft apply to RPA.

3.1.15.2 Dangerous goods are items or substances that are a risk to health, safety, property or the environment when transported by air. Obvious dangerous goods include:

- acids
- chemicals and poisons
- compressed gases
- explosives
- flammable liquids
- radioactive materials.

3.1.15.3 The carriage of certain dangerous goods, and in certain quantities, by an RPA is prohibited without CASA authorisation.

3.1.15.4 Dangerous goods that are essential to the operation of the RPA (excluding the RPA payload), such as the RPA's energy system (lithium battery, liquid fuel, etc.) are not covered by the prohibition on carriage of dangerous goods by the RPA.

3.1.15.5 Operators should also be aware of their dangerous goods obligations when transporting RPA and associated equipment on other aircraft.

3.1.15.6 Operations involving the carriage of dangerous goods will require training for all persons involved in the operation.[20]

3.1.15.7 Further information on the carriage of dangerous goods is available on the CASA website.

3.1.16 Australian territory

3.1.16.1 Australian territory includes the territory of Australia and of every external Territory; the territorial sea of Australia and of every external Territory; and the air space over any such territory or sea. Australian territorial sea is a belt of water not exceeding 12 nautical miles in width measured from the territorial sea baseline (approximately the low tide mark).[21]

3.1.16.2 Australia is subject to international obligations in relation to the operation of Australian aircraft (including RPA) outside of Australian territory.

3.1.16.3 Operations of Australian RPA outside of Australian territory must comply with Australia's international obligations.

3.1.16.4 Included operators planning to operate outside of Australian territory should contact CASA.

[20] See CASR Part 92.

[21] Details of Australia's territorial sea are available from Geoscience Australia's website.

3.2 Applying for CASA flight authorisations

3.2.1 Overview

3.2.1.1 This section details the general process and requirements for applying for a flight authorisation from CASA, such as an approval to operate above 400 ft AGL.

3.2.1.2 An excluded operation must comply with the SOC, and therefore cannot be issued with an approval to operate contrary to the SOC.

3.2.1.3 Before using an RPA for a particular task, ReOC holders should first assess whether the flight/mission is within the scope of their approved operations. This is commonly referred to as the feasibility process. This process will identify whether an additional CASA authorisation is required. Where the proposed operation is outside the ReOC holder's current authorisations, operators should apply to CASA.

3.2.1.4 Requests for approval should be submitted via email to CASA with the appropriate application form which is available on the CASA website. To assist with the application process and fee estimation, CASA requires details of the purpose, scope of the operations and all operational documentation to be included in the application.

3.2.1.5 There may be delays if all the required information is not included when the application is submitted. CASA is unable to make any assessment or provide significant advice without first providing an estimate of costs and receiving payment.

3.2.2 Safety case

3.2.2.1 When CASA considers an application for an operation outside of the SOC, it must consider the impact on the safety of other airspace users and persons and property on the ground.

3.2.2.2 To enable CASA to appropriately assess the safety implications of issuing the proposed authorisation, the operator should submit a safety case with the application that details the Concept of Operations (ConOps), risk profile and risk mitigation strategies. For simple operations, this may be via updated DPP, and a job safety and risk assessment. More complex operations may require a standalone safety case document suite.

3.2.2.3 The safety case should demonstrate to CASA that the applicant has a thorough understanding of the additional risks involved in the proposed operation and has implemented appropriate mitigators to ensure an acceptable level of aviation safety.

3.2.2.4 Application processing times may be impacted by the quality of the safety case provided. The safety case should be as concise as possible while providing appropriate detail on key items. A safety case that omits relevant considerations may result in the application being rejected.

3.2.2.5 For complex operations, including BVLOS, CASA expects that the application will follow the JARUS SORA methodology.

3.2.3 Airspace protection

3.2.3.1 Area approvals may be considered by CASA's Office of Airspace Regulation (OAR) to determine whether an airspace solution is required for the operational area. This is necessary to address any residual risk after the application of other risk mitigations.

3.2.3.2 If residual risk exists with all mitigations in place, an applicant may be required to submit an airspace change proposal; this process is defined in the OAR operations manual, which can be accessed through the CASA website. Staff in the CASA RPAS office will coordinate with the OAR, as required.

3.2.4 Authorisation instrument

3.2.4.1 If authorised, the operator will be issued with an instrument that details the authorisation and any conditions.

3.2.4.2 The instrument will generally contain a commencement and expiry date that must be observed by the operator.

3.2.4.3 CASA may impose limitations on the operation of an RPA to ensure that the RPA will pose no greater threat to the safety of air navigation than posed by a similar operation involving a conventionally piloted aircraft. Such limitations may include but not limited to:

- altitudes
- geographical restrictions
- radio broadcast requirements
- the provision of observers
- the timing of operations
- pilot qualifications, experience, and competency in relation to the operator's procedures.

3.2.4.4 The issue of an authorisation does not convey additional privileges over those expressly stated in the instrument. For example, an area approval authorising BVLOS operations in a sparsely populated area does not authorise operations over persons unless expressly stated in the authorisation.

3.3 General operational matters

3.3.1 Planning and risk assessment

3.3.1.1 When conducting RPA operations, the most important considerations are the safety of:

- other aircraft in the airspace
- people and property on the ground
- the crew.

3.3.1.2 Care should be taken in areas where low-level conventionally piloted aircraft operations take place, especially in the vicinity of aerodromes, beaches and scenic areas (e.g., helicopters on shark patrol). All RPA operators, remote pilots and observers should be acutely aware that low-flying aircraft may suddenly appear with little warning. Even relatively noisy aircraft may not be heard by the remote crew due to wind, the RPA's motors, and other noises.

3.3.1.3 All RPA operators have an obligation to ensure that their RPA operations do not cause a hazard. Pre-flight planning is an important element in ensuring RPA operations can be conducted safely.

3.3.1.4 Several CASA-verified drone safety apps are available that use location-based maps to show where RPA can be operated according to aviation legislation. Details of the drone safety apps can be found on the CASA website.

3.3.1.5 ReOC holders are required to retain certain records related to flight conduct, including flight planning (see Chapter 10 of the Part 101 MOS).

3.3.1.6 Operators should also make crew aware of 'cognitive tunnelling', where the remote pilot is so focused on the task at hand that other events and noises are not perceived or identified until it's too late to take corrective action.

3.3.2 NOTAM

3.3.2.1 A NOTAM is used to alert pilots and crews about activities that may be hazardous to aviation operations.

3.3.2.2 RPA operators should check NOTAMs prior to flight to ensure that there are no temporary hazards or changes to airspace that will impact RPA operation.

3.3.2.3 The National Aeronautical Information Processing System (NAIPS), managed by AA, contains all current NOTAM. Access to the system is free for airspace users and available on the AA website.

3.3.2.4 Several of the drone safety apps also display NOTAM relating to localised airspace hazards.

3.3.2.5 When issuing an authorisation, CASA may require an included operator to raise a NOTAM advising other airspace users of the intended operations. Details of how to raise a NOTAM are contained in section 3.3.8.

3.3.2.6 ReOC holders may apply to CASA to become a NOTAM originator through AA.

3.3.3 Danger areas

3.3.3.1 CASA has established danger areas in locations of higher airspace activity that are not managed by air traffic control, e.g., parachute operations, flight training areas etc. The locations of danger areas are marked on aeronautical charts and related activities are published in ERSA. Danger areas are also displayed on CASA-verified drone safety apps.

3.3.3.2 Temporary areas of heightened aviation activities (e.g., gliding competitions) or risks to aircraft operations (e.g. fireworks) are notified via NOTAM.

3.3.3.3 RPA operations are permitted in danger areas; however, the RPA operator should consider the increased risks and implement appropriate mitigators. Failure to do so may be considered a hazardous operation of an RPA.

3.3.4 Communications

3.3.4.1 Remote pilots operating RPA with a gross weight of more than 2 kg in controlled airspace must meet the aeronautical radio qualification and use requirements detailed in regulation 101.285 of CASR.

3.3.4.2 Operations with very small RPA below 400 ft/120 m AGL and outside of the no-fly zone of a controlled aerodrome are not required to use aeronautical radio, although CASA recommends that remote pilots with radio qualifications (see section 5.6) monitor the relevant frequency.

3.3.4.3 Radio use is not required for operations below 400 ft/120 m AGL outside controlled airspace, but suitably qualified remote pilots should use their best judgement as to whether broadcasts or responses to transmissions by other stations would enhance the safety of their operations.

3.3.4.4 If required, position reporting to other traffic should be referenced to the RPA position (not the remote pilot position) relative to an aerodrome, navigation aid, prominent ground feature, etc.

3.3.4.5 An operator's DPP should address how communications between any crew and the remote pilot will be managed. It should also detail how communications with any third parties (e.g., air traffic control [ATC] and other aircraft) would be handled in the event of the loss of the primary communication channels.

3.3.5 Transponders and aircraft surveillance

3.3.5.1 CASA will only approve the use of a secondary surveillance radar (SSR) or an automatic dependent surveillance broadcast (ADS-B) transponder (electronic conspicuity (EC) device) if it is required for the duration of an RPA operation, subject to CASA assessment, in the interest of air navigation safety. In general, approval will only be issued to BVLOS operations above 400 ft

in non-controlled airspace, BVLOS operations in controlled airspace, or other operations that are integrating with crewed aircraft and require ADS-B out for separation requirements.

3.3.5.2 Operation of an EC device requires a letter of agreement between the operator and ANSP specifying the use of ADS-B.

3.3.5.3 An ICAO 24-bit aircraft address will only be issued to an EC device listed on the CASA website as having a valid declaration of capability and conformance. Approved EC devices may be used for single or multiple RPA. See AC 91-23 for further details on fitment of EC devices.

3.3.6 Recommendation for RPA conspicuity

3.3.6.1 RPA should be painted or patterned for maximum visibility. This may involve the use of high gloss, high visibility paint and contrasting colours and, where practicable, suitable collision avoidance lighting, such as strobe lights.

3.3.7 Precautions for automated flight

3.3.7.1 Care should be taken when inserting flight plans into the ground control station (GCS) for automated operations. Instances have occurred where incorrect or corrupt information has resulted in a crash or loss of the RPA. Transferring way points from one program or application to another can cause errors, as can corrupt or outdated software. Automated flights should be continuously monitored to identify any deviations from the intended flight path, and rapid remedial action taken to fix the problem or terminate the flight to avoid creating an unnecessary hazard.

3.3.8 Raising a NOTAM

3.3.8.1 NOTAMs are required if an operator has been issued an Instrument of approval that contains a condition requiring a NOTAM. This includes approvals for:

a. operating within 5.5 km (3 NM), in any direction, from the measurement point of any runway of a controlled aerodrome

b. operating over the movement area of any aerodrome

c. operating above 400 ft (120 m) above ground level

d. operating beyond visual line-of-sight (BVLOS).

3.3.8.2 RPAS operators seeking to have a NOTAM issued should complete the latest version of the NOTAM Request Form as published by AA. It is highly recommended to follow the NOTAM Data Quality Requirements for Unmanned Aircraft Operators as well as the NOTAM Originator User Guide (both accessible from the above link), as NOTAM requests that contain errors will not be accepted.

3.3.8.3 The method of submission of the NOTAM Request Form will depend on whether the operator is a ‘NOTAM authorised person’. If registered as a NOTAM authorised person, the completed NOTAM Request Form can be directly submitted to the NOTAM office (NOF). If not, the form should be submitted to CASA (send to rpas.pac@casa.gov.au only) for quality checking and submission to the NOF.

3.3.8.4 Individuals that are registered as NOTAM authorised persons with AA can request a NOTAM to be issued via the NOTAM Request Form or electronically via the NOTAM Web Service in NAIPS.

3.3.8.5 To register as a NOTAM authorised person, the chief remote pilot should contact AA to identify the relevant ReOC and the operator's intent to register.

3.3.8.6 When submitting NOTAMs via CASA, CASA requires the request be provided to CASA’s RPAS office at least 2 business days prior to the required publishing date. Please note these requests can only be actioned during business hours (0800-1700 AEST, Monday to Friday).

Note: CASA receive a large percentage of NOTAM request forms from the RPAS industry that require correction before they may be submitted. Errors in a NOTAM request form may result in the issue of a NOTAM being delayed or otherwise rejected by CASA or AA.

3.4 Abnormal operations

3.4.1 Preparing for abnormal situations

3.4.1.1 Operators need to be prepared for an abnormal situation. Even the best designed, manufactured, and maintained RPA will suffer failures. External factors, such as weather and other airspace users, can also contribute to an abnormal situation.

3.4.1.2 Abnormal operations that are not properly managed can readily become emergencies, resulting in potential injury or property damage.

3.4.1.3 All RPA operators should have a thorough understanding of the potential abnormal states and appropriate reactions. Most RPA manufacturers provide emergency checklists to aid the remote pilot.

3.4.1.4 CASA expects the ReOC holder's DPP identify relevant emergency procedures to be followed under normal operations. If type specific emergency procedures are required, these should be identified in the specific RPA section.

3.4.1.5 If the standard emergency procedure cannot be achieved or requires slight variation due to the specific task at hand, the RPA mission plan should detail the emergency procedures to be followed in the event of an emergency, such as:

- engine/propeller failure
- loss of data link
- loss of control
- failure of navigation equipment e.g., loss of GPS
- airframe damage.

3.4.1.6 The RPAS data link should be continuously and automatically monitored while the RPA is in flight, and a real-time warning should be displayed to the remote pilot in the case of failure.

3.4.1.7 In the case of a lost control data link, other than intermittent loss of signal or during programmed periods of outage, the pilot should:

- advise ATS (if applicable) and any aircraft in the vicinity if the RPA is likely to pose a hazard
- execute recovery procedures.

Note: The parameters that determine acceptable intermittent loss of signal and total loss will be pre-determined by the manufacturer and documented in the operations manual.

3.4.2 Reporting

3.4.2.1 The *Transport Safety Investigation Regulations 2021* require the reporting of certain transport safety occurrences to the ATSB as immediately or routine reportable matters to enhance aviation safety by facilitating the collection, analysis, and dissemination of information about accidents and incidents in civil aviation.

3.4.2.2 Two types of RPA are subject to specific reporting requirements:

- Type 1 RPA are type certified; large (more than 150 kg) or medium (more than 25 kg but not more than 150 kg) RPA.
- Type 2 RPA are not Type 1 and are not an excluded or micro (250 g or less) RPA.

3.4.2.3 Type 1 operators are required to immediately report to the ATSB, RPA occurrences involving:

- death or serious injury
- accidents
- loss of a separation standard with aircraft
- serious damage to property.

3.4.2.4 Less serious incidents and occurrences are required to be reported to the ATSB within 72 hours.

3.4.2.5 Occurrences involving Type 2 RPA need to be immediately reported to the ATSB if they involve death or serious injury, while less serious incidents and damage to the RPA will need to be reported within 72 hours.

3.4.2.6 Reporting must be in accordance with ATSB requirements (see the ATSB website).

3.5 Other considerations

3.5.1 Legal restrictions

3.5.1.1 CASA regulations do not grant an RPA operator any rights against the owner or occupier of any land on or over which operations are conducted. They do not prejudice the property rights of a person in respect of any injury or damage to property caused directly or indirectly by an RPAS operation.

3.5.1.2 Compliance with CASA regulations do not absolve the operator from compliance with any other regulatory requirements that may exist under Commonwealth, State, or local law.

3.5.2 Surveillance and enforcement

3.5.2.1 As with other sectors of the aviation industry, RPA operators are subject to oversight, surveillance, and enforcement by CASA.

3.5.2.2 Oversight and surveillance can be in the form of safety audits of the ReOC's facilities, RPA and procedures, and on-site checks of flying operations.

3.5.2.3 Operators and pilots should be aware that Part 117 of CASR contains severe penalties for a person misrepresenting that they hold civil aviation authorisations. It is an offence to represent that a person is willing to conduct an RPA operation in circumstances where they do not hold the appropriate authorisation.

3.5.2.4 Non-compliance with regulations will be investigated and operators found to be in breach may be subject to safety and/or enforcement action. See the CASA website for more information.

3.5.3 Privacy

3.5.3.1 CASA does not consider privacy concerns when issuing approvals.

3.5.3.2 CASA strongly recommends operators include relevant privacy provisions in their operations manuals (refer to the *Privacy Act 1988)*.

3.5.3.3 Further information can be found on the Office of the Australian Information Commissioner's website.

3.5.4 Aviation security

3.5.4.1 Remote crew members operating an RPA from a security-controlled airport, should consider the applicable aviation security requirements for access to airport operational areas. Refer to the Department of Infrastructure, Transport, Regional Development, Communications and the Arts' aviation safety website for further information.

3.5.5 Drug and alcohol management plan (DAMP) and testing

3.5.5.1 CASA encourages all RPA operators to develop a policy that identifies reasonable practices and procedures for fitness for duty and the management of drug and alcohol matters for their personnel. These policies may be developed alongside the DAMP requirements identified in Part 99 of CASR.

3.5.5.2 As RPA operators are not currently required to develop a DAMP as set out in Part 99 of CASR, CASA will not approve the system as a DAMP under the regulations.

3.5.5.3 CASA will identify whether the operator's practices and procedures for fitness for duty and the management of drug and alcohol matters are acceptable as part of the documented practices and procedures of the RPA operator.

3.5.6 Frequency spectrum management

3.5.6.1 To operate a radio transmitter, a radio communications apparatus licence issued by the Australian Communications and Media Authority (ACMA) must be obtained. A radio transmitter not only includes radios used for voice communications, but also includes the radio control devices used on RPAS.

RPAS command and control link

3.5.6.2 The majority of commercial-off-the-shelf RPAS will fall under the Radiocommunications (Low Interference Potential Devices) Class Licence 2015 (LIPDCL), as it exists from time to time, however, the operator of a radio transmitter must ensure they adhere to any requirements from ACMA.

3.5.6.3 Common LIPDCL frequencies for command and control of RPA in Australia are 915 MHz, 2.4 GHz and 5.8 GHz. The class licence imposes transmitter strength requirements cased on the technology used.

Aeronautical radio

3.5.6.4 AA is responsible for the Aeronautical Radiofrequency Spectrum within Australia and its Territories. AA can provide a frequency assignment service as a first step to obtaining a radio communication apparatus license to operate a radio transmitter within the aeronautical bands. Assignment can be made for radio communications, links, navigation aids, surveillance, and landing systems.

3.5.6.5 The frequency band allocated for aeronautical very-high frequency (VHF) communications is 118-137 MHz.

3.5.6.6 AA is also responsible for the radiofrequency spectrum used for aeronautical high frequency (HF) and ultra-high frequency (UHF) communication, navigational aids and landing system.

3.5.7 Environment

3.5.7.1 RPA operators have obligations under the *Environment Protection and Biodiversity Conservation Act 1999 and related state and local legislation*.

3.5.7.2 CASA strongly recommends that operators make themselves aware of their environmental obligations. ReOC holders should address these obligations in their DPP.

3.5.7.3 For RPA operations which involve discharging chemicals, pesticides or other environmentally hazardous materials, CASA strongly recommends the operator contact the environmental protection agency in the relevant state or territory, to identify any requirements for aerial application.

3.5.8 Noise regulations

3.5.8.1 RPA are subject to requirements under the Air Navigation (Aircraft Noise) Regulations 2018 (Noise Regulations). RPA generally require a noise certificate from the Department of Infrastructure, Transport, Regional Development, Communications and the Arts prior to operations outside of the SOC.

3.5.8.2 RPA operators do not need to seek an approval under the Noise Regulations if operations occur for one or more of the following purposes:

- agricultural operations
- environmental operations
- firefighting, medical, emergency, or policing operations.

3.5.8.3 Only the ReOC holder should apply for an approval under the Noise Regulations. RePL holders who operate RPA under a ReOC need not apply.

3.5.8.4 If a ReOC holder is unsure if an approval is required, it is recommended that the self-assessment application form is used.

3.5.9 Insurance

3.5.9.1 CASA strongly recommends operators discuss with an insurer the potential liability for any damage to third parties resulting from RPAS operations and consider suitable insurance.

3.5.9.2 CASA will not consider an insurance policy as a risk control measure or risk mitigation strategy when assessing any application from a certified RPA operator.

4 RPA operator's certificate

4.1 Overview

4.1.1 A ReOC is required for any operation that is not an excluded RPA operation, including for:

- all RPA operating outside of the SOC, other than micro RPA and model aircraft operations
- RPA weighing more than 2 kg flying, unless operating under the SOC and meeting the 'landholder' criteria
- all operations with a large RPA.

Note: Model aircraft are, by definition, used for sport and recreation and do not require a ReOC.

4.1.2 The benefit of holding a ReOC is that it permits a range of RPA operations, subject to an approval or a permission, that are unavailable to other operators (see Chapter 3).

CASA can be contacted if there is uncertainty about whether a ReOC is required.

4.2 RPA operator's personnel

4.2.1 Overview

4.2.1.1 There are several distinct key personnel roles within a ReOC holder, each with different responsibilities, that together ensure the safety of RPA operations. As a minimum, a ReOC holder will have the follow key personnel positions: a CEO/managing director, chief remote pilot (CRP) and a maintenance controller (MC).

4.2.1.2 Depending on the size and complexity of the operations, an individual may fill more than one key position. The operator should consider the capacity of the nominated personnel to fulfill the roles and responsibilities of the positions and any conflicts that may arise by holding multiple key positions. Duties may be delegated to other suitably qualified persons; however, responsibilities cannot be delegated.

4.2.1.3 As the operations expand, other personnel will be required, including remote pilots and RPA crew. Figure 1 shows the relationships between the CRP, remote pilot and other members of the remote crew.

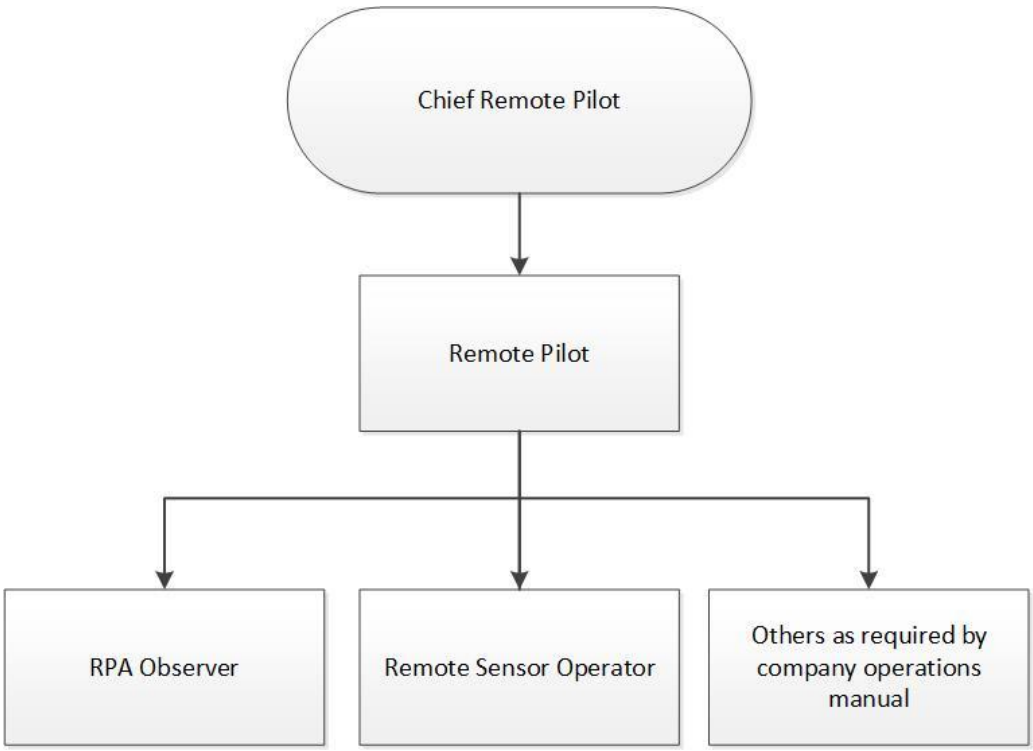

Figure 1: Remote crew organisational structure

4.2.2 Chief remote pilot

4.2.2.1 All ReOC holders must either qualify to be, or employ, a CRP.[22] Currently CASA does not require additional training qualifications or experience requirements for the position of company CRP. However, to be considered suitable, the person would need to hold a RePL and advanced knowledge and experience commensurate with the operator's planned operations. The company must ensure that the person intending or proposed to occupy the position can effectively carry out the functions and duties of the CRP required by regulation 101.342 of CASR, specifically:

- ensuring the operator's RPA operations are conducted in accordance with the civil aviation legislation
- maintaining a record of the qualifications held by each person operating an RPA for the operator
- monitoring the operational standards and proficiency of each person operating an RPA for the operator
- maintaining a complete and up-to-date reference library of the operational documents required by CASA, under paragraph 101.335 (1) (d) of CASR for the types of operations conducted by the operator.

4.2.2.2 The person nominated to fulfill the role of CRP will be required to undergo an assessment by CASA. The assessment involves a scenario-based activity and a set of questions relating to the operation of RPA under the authority of a ReOC. To be successful, the nominated CRP should have a thorough knowledge of:

- the company's documented practices and procedures

[22] In accordance with paragraph 101.335 (1) (f) of CASR.

- Part 101 of CASR
- Part 101 Manual of Standards
- aviation safety management systems (SMS)
- aeronautical information package (AIP)

4.2.2.3 A company must not perform ReOC operations unless a person has been approved by CASA to fulfill the role of the CRP within that company and they are fulfilling the roles and responsibilities of that role.

4.2.2.4 If the nominated CRP is no longer fulfilling the role of CRP, or the company intends to change the nominated CRP, an application must be made to CASA using Form 101-02 - Application for RPA Operator's Certificate (ReOC) (initial issue/variation/renewal).

4.2.2.5 In large organisations, the CRP may not be licenced to operate multiple RPA that are listed on the ReOC. If this is the case, the operator may nominate a 'type specialist' who is licenced on the RPA. The role of the type specialist is to develop RPA-specific procedures and to work with the CRP to oversee operations.

4.2.3 Maintenance controller

4.2.3.1 All ReOC holders must have a MC. The MC is responsible for ensuring that the RPA operated under the ReOC are serviceable. The legislated functions and duties of a MC can be found in AC 101-05.

4.2.3.2 Currently CASA does not require additional training qualifications or experience requirements for the position of company MC. However, to be suitable, the person would need to have technical knowledge of the operator's RPA systems and understand the operator's maintenance practices and requirements.

4.2.3.3 For ReOC covering RPA not greater than 150 kg, CASA does not assess the suitability of the MC. It is up to the operator to ensure the MC has sufficient knowledge and experience to fulfill the MC duties.

4.2.4 Remote pilot

4.2.4.1 Any other remote pilots working for the operator must hold a RePL and be inducted into the company. This induction must include training on all operational practices and procedures, and practical competency checks on the RPAS to be operated within the company.

4.2.5 RPA observers and other remote crew

4.2.5.1 CASA does not specifically approve other remote crew members. RPA observers and other remote crew should complete an operator's course of training appropriate to their function, in accordance with the syllabus and program in the operator's approved operations manual.

4.2.5.2 Competency standards and training for intercommunication among RPAS crew (e.g., between an RPA observer and remote pilot) is the responsibility of the operator. Training procedures and standards must be included in the operations manual.[23]

4.2.5.3 RPAS operators must maintain records that show the training delivered to, and the level of competency of, personnel in non-regulated roles.[24] This should be consistent with the requirements in Chapter 10 of the Part 101 MOS.

[23] In accordance with subregulation 101.335 (1) of CASR.

[24] In accordance with regulation 101.272 of CASR.

4.3 Documented practices and procedures

4.3.1 Overview

4.3.1.1 It is a condition on certification that each ReOC holder has suitable documented practices and procedures (DPP). The purpose of an operator's DPP is to provide instruction to operating crew on how to conduct RPA operations in a way that will ensure an acceptable level of safety is maintained.

4.3.1.2 The rigor of the operator's DPP will increase with the complexity in operations being conducted. For example, an operator conducting only SOC operations with small RPA may have limited procedures. An operator's DPP will only meet the suitability requirement where they are fit for purpose.

4.3.1.3 In many cases, there is more than one way to achieve the desired safety outcome. Therefore, there is usually not one correct method of operating that should be followed by all operators.

4.3.1.4 CASA reviews each operator's DPP in initial issue, and upon any significant change (see chapter 4.8.1), to ensure the DPP meet the minimum standard.

4.3.1.5 The contents of an operator's approved DPP form legal obligations on the operator and must be followed. Care should be taken to ensure the operator and all personnel understand and abide by the documented practices and procedures.

4.3.2 Operations manual

4.3.2.1 Most operators include the DPP in a document called an 'operations manual', with sections covering management, record keeping, training, checking, maintenance, normal operations, and emergency response. CASA does not dictate the format and content of an operator's DPP. Each operator is different and the DPP should reflect the needs of the operator.

4.3.2.2 To make it easier for persons wishing to obtain a ReOC, CASA has published a RPAS sample operations manual and a guide to the sample manual, which is available on the CASA website. The sample manual identifies acceptable means of compliance for a small, non-complex operator, and can be used as a starting point for the company's operations manual. The guidance document identifies acceptable requirements within the manual and also includes other templated procedures for complex operations.

Note: Operators are not obligated to utilise the CASA sample operations manual and should ensure that their DPP are fit for purpose.

4.3.3 RPAS manuals

4.3.3.1 In addition to the company operations manual, CASA expects that an operator will have flight and maintenance manuals for each RPAS to be operated. These manuals form part of the operator's DPP.

4.3.3.2 The level of detail and complexity in these manuals will depend on the systems operated and the type of operations conducted. For example, the RPAS flight manual and maintenance manual may be a single document for simple aircraft.

4.4 Training obligations of a ReOC holder

4.4.1 To ensure the remotely piloted aircraft community conducts safe RPA operations, operators and remote pilots should keep up to date with the development of technology and procedures. Operators should also ensure they and their remote crew are appropriately trained and competent in conducting RPA operations.

4.4.2 Operators should determine the training required for their RPA crew and detail this in their operations manual. If a remote pilot does not fly within any currency timeframe identified in the operations manual for the RPA, a refresher program of theory and practical flying should be conducted. Some of the practical training may be done using a simulator.

4.5 RePL training organisations

4.5.1 Organisations wishing to conduct RePL training courses for the issue of an RePL must be assessed and approved by CASA. The assessment includes a review of all relevant training documentation and a face-to-face assessment, where the delivery of practical and theoretical training in accordance with the Part 101 MOS and the operator's documented practices and procedures.. Further information can be found on the 'Become a training provider' page on the CASA website.

4.6 Obtaining a ReOC

4.6.1 Application process

4.6.1.1 Figure 2 depicts the steps involved in preparing a ReOC application. Before applying for a ReOC, applicants should consider the type(s) of operations planned and the category and size of RPA to be used.

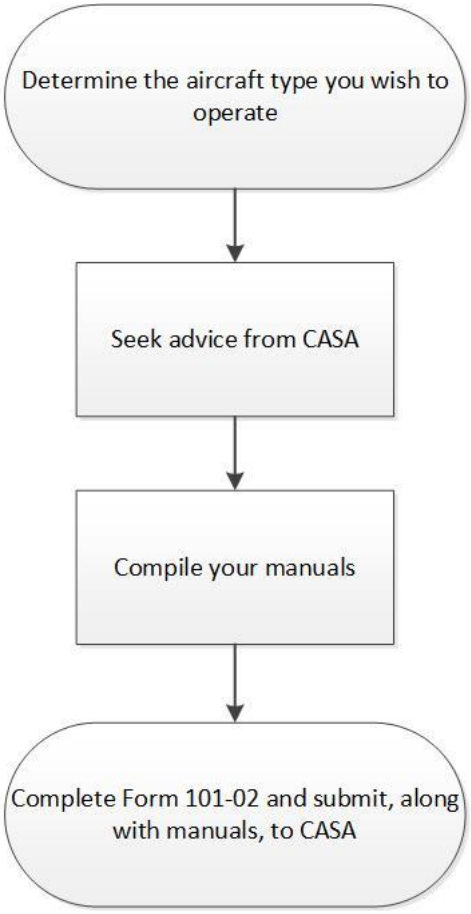

Figure 2: Steps in preparing a ReOC application

4.6.2 Submitting a ReOC application

4.6.2.1 An application for a ReOC is made using Form 101-02. The application may be made directly to CASA or to an industry delegate who will assess the application on behalf of CASA (see the CASA website). Applications made directly to CASA should be submitted electronically at rpas.pac@casa.gov.au.

4.6.2.2 For applications made directly to CASA, CASA will conduct an administrative assessment and estimate the time and cost for processing and assessing the application. CASA will then send the applicant an invoice for payment, based on the estimate, which CASA requires to be paid before the formal assessment process by CASA can commence.

4.6.3 Nomination of key personnel

4.6.3.1 Each operator must nominate a CRP and a MC via Form 101-02. Details of the CEO/managing director must also be provided. Information about being assessed and approved by CASA as a chief remote pilot can be found in section 4.2.2. For operations in RPA weighing more than 150 kg, the maintenance controller is also assessed for suitability by CASA (contact CASA for further information).

4.6.3.2 If applying to conduct RePL training, a CRI must also be nominated using Form 101-02. Information about being assessed and approved by CASA as a CRI can be found in Annex A of this AC.

4.6.3.3 The same person may hold one or more of the key personnel positions. The operator should consider the capacity of the nominated personnel to fulfill the roles and responsibilities of the positions and any conflicts that may arise by holding multiple key positions.

4.6.4 Assessment of application

4.6.4.1 The formal assessment will include:

- assessment of the applicant's manuals
- assessment of the CRP
- assessment of the MC if the company intends to operate large RPA (RPA with MTOW >150 kg)
- if applying to become an RePL training organisation, further assessment is required. See the 'Become a training provider' page on the CASA website.

4.6.5 Issue of a ReOC

4.6.5.1 CASA will issue successful applicants with a ReOC including the authorisation 'RPAS Aerial Work', which permits the operator to conduct RPA operations under the general flight rules (see section 4.1).[25] A ReOC does not confer on the holder any other privileges, and operators must also ensure that they meet any other Commonwealth, State, Territory, and local laws applicable to their activities.

4.6.5.2 The initial issue of a ReOC will usually be for up to 12 months. The validity period of a ReOC will usually be longer after completion of the first renewal, with the period based on the complexity of the operations and the operator's past compliance history. Typically, subsequent renewals are issued for 3 years.

[25] RPAS aerial work does not include passenger-carrying operations.

4.7 Renewal and amendment of a ReOC

4.7.1 Renewal

4.7.1.1 Renewal of a ReOC that does not require any changes can be completed online through the myCASA portal. Applications should be submitted at least 5 business days before the ReOC expires. If the ReOC expires before the renewal is processed, the holder will no longer be authorised to operate and a new application for a ReOC will be required.

4.7.1.2 Under CASA's cost recovery model, there is a fee for renewing a ReOC.

4.7.1.3 Renewal of a ReOC with changes is considered a variation (see chapter 4.6.2) and requires a Form 101-02 to be submitted to CASA.

4.7.2 Varying a ReOC

4.7.3 Intended or proposed changes that will require the ReOC to be reissued are outlined below:

- Increase or decrease in operational gross weight e.g., multi-rotor 7 kg to multi-rotor 25 kg
- Addition or removal of category of RPAS e.g., adding fixed-wing 25 kg, removing helicopter 7 kg
- Addition or removal of an RPAS above 25 kg (medium and large RPA are type rated for RePL and ReOC)
- Change to legal entity.

4.7.4 Different flight activities and RPA types may be added to the ReOC later, and this will require suitable procedures to be added to the approved operations manual.

4.7.5 If the ReOC requires a reissue, an application must be made to CASA, using Form 101-02. Under CASA's cost recovery model, CASA charges a fee for variation of a ReOC.

4.7.6 Addition of RPAS that are within the current authorisations on the ReOC are a non-significant change (see section 4.8) and this does not require CASA to reissue the ReOC (e.g., an organisation is issued an ReOC for multi-rotor 7 kg and then brings online a multi-rotor RPAS that weighs 5 kg).

4.8 Changes to a ReOC holder's operations

4.8.1 Significant changes

4.8.1.1 While ReOC holders are approved to carry out ‘included’ operations in general, each ReOC is issued based on the intended operational profile of the operator. An operator's DPP will detail the types of operations carried out by the operator, including the relevant RPA and crew. The documented practices and procedures must be updated upon a change to the ReOC holder's operations.

4.8.1.2 Depending on the type and complexity, the change to the ReOC holder's operations and the related documented practices and procedures may require prior approval from CASA. Those requiring prior approval are known as significant changes, as defined in the Part 101 MOS. The following are examples of significant changes:

- changes to the organisational structure
- changes to the qualifications, experience or accountabilities/responsibilities for any position
- changes to the amendment procedures which are not in accordance with Chapter 10 of the Part 101 MOS

- changes, that do not maintain or improve, or are not likely to maintain or improve, aviation safety, for:
  - normal, specialised or emergency procedures
  - maintenance requirements
  - training and checking
  - risk assessment methodology
  - fatigue.

4.8.1.3 Approval for a significant change is requested by submission of a completed RPAS ReOC - Significant Change Approval and/or Notification of Non-Significant Changes form to CASA. Some significant changes will require a variation to the ReOC (see chapter 4.7.2). A change to the key personnel (CEO, CRI, CRP, MC) should be submitted using Form 101-02.

4.8.1.4 All significant changes are reviewed by CASA. Under CASA's cost recovery model, there is a fee payable to have CASA review and approve the significant change.

4.8.1.5 Where the significant change involves a change to the operator's documented practices and procedures, the operation must not commence operating under the new system until written authorisation from CASA is obtained.

Note: A proposed significant change cannot be made and then notified to CASA after the event.

4.8.2 Non-significant changes

4.8.2.1 Changes that are not classified as a significant change (see chapter 4.8.1) do not require prior CASA approval. However, the operator must notify CASA of the change within 21 days of the change occurring. Examples of non-significant changes include, but are not limited to:

- adding a new RPA to RPA type register in the RPAS Operations Manual that is within the approved scope of the ReOC
- fixing up typographical errors or formatting issues
- changes, that maintain or improve or are likely to maintain or improve aviation safety, to:
  - documented practices and procedures for the conduct of RPA operations
  - training and checking
  - documented practices and procedures for managing operational risk
  - documented practices and procedures for managing the risk of fatigue for personnel
  - documented practices and procedures for managing RPA maintenance.

4.8.2.2 Notification to CASA of a non-significant change is made by using the myCASA portal or submitting a completed RPAS ReOC - Significant Change Approval and/or Notification of Non-Significant Changes form.

4.8.2.3 When advising CASA of a non-significant change the operator must make a declaration that the change is non-significant; CASA relies on the declaration and generally will not review the non-significant change.

Note: Where an operator incorrectly declares a change is non-significant, the change is not approved. It is an offence to make a significant change without prior approval from CASA.

4.8.2.4 CASA does not charge the operator a fee for a non-significant change.

4.9 Record keeping

4.9.1 ReOC holders are required to maintain certain records relating to the organisation's operations, RPA and crew. Chapter 10 of the Part 101 MOS details the records that must be maintained. The DPP of the individual ReOC holder may require addition records to be maintained.

4.9.2 The sample RPA operations manual available on the CASA website contains a number of record templates designed to meet the requirements of the Part 101 MOS.

5 Remote pilot licensing and qualifications

5.1 This chapter provides the information necessary for an applicant to obtain a RePL and describes the various limitations and permissions that may be attached to a RePL. It also provides details of additional qualifications that a RePL holder may require for specialised operations.

5.2 RPA categories and types for a RePL

5.2.1 For the purposes of licensing, RPA are divided into several categories:

- aeroplane
- helicopter (single-rotor class)
- helicopter (multi-rotor class)
- airship
- powered lift (hybrid aeroplanes with vertical take-off capability).

5.2.2 RPA are also divided into types:

- **Micro:** with a gross weight of not more than 250 g.
- **Very small:** with a gross weight of more than 250 g and not more than 2 kg.
- **Small:** with a gross weight of more than 2 kg and not more than 25 kg.
- **Medium:** with a gross weight of more than 25 kg and not more than 150 kg.
- **Large:** with a gross weight greater than 150 kg (or > 100 m3 envelope for airships).

5.2.3 Initial training can be done with CASA-approved training organisations. Further information can be found on the CASA website, Get your operator credentials | Civil Aviation Safety Authority (casa.gov.au).

5.2.4 CASA will issue a RePL to a person who qualifies as a remote pilot. Based on that person's experience and further training, the operating organisation (the ReOC holder) can assign its crew to meet operational requirements. The criteria for each remote crew position should be set out in the company operations manual. [26]

5.3 RePL application process

5.3.1 Existing UAV controller's certificate holders

5.3.1.1 Holders of unmanned aerial vehicle (UAV) controller's certificates continue to be authorised to exercise the privileges of that qualification under the amended Part 101. UAV controller certificate holders can transfer at any time to a RePL on request. A certificate holder seeking a variation to their flying privileges (e.g., adding an approval or removing a limitation) will be automatically issued a RePL. Both controller's certificate holders and RePL holders are subject to the conditions set out in regulation 101.300 of CASR.

[26] In accordance with regulation 101.335 of CASR.

5.3.2 Applicant with no aeronautical qualifications

5.3.2.1 An applicant for a RePL with no aeronautical qualifications should complete the following steps:

a. Apply for an Aviation Reference Number (ARN) (refer to Appendix B).

b. Complete an RePL training course through an approved RePL training organisation. The RePL training organisation will ensure the minimum experience has been obtained and will submit the required documentation for the RePL to be issued.

5.3.3 Applicant with previous aeronautical qualifications

5.3.3.1 Applicants who already hold a pass in an aeronautical knowledge examination[27], CASA-issued pilot qualification or an acceptable overseas or military equivalent qualification will need to complete either of the following:

a. Pass the practical component of an RePL training course through an RePL training organisation (the RePL training organisation will submit the application for the RePL to CASA).

or

b. Provide evidence of completion of the practical competencies from a CASA approved training organisation and pass a CASA flight test.

5.3.4 Application to fly beyond visual line of sight operations

5.3.4.1 An RePL holder who intends to conduct beyond visual line of sight (BVLOS) operations outside of an enclosed space must hold a pass in at least one of the following exams[28] or have a supervising remote pilot that meets the requirements:[29]

- an aeronautical knowledge examination for an instrument rating under Part 61
- the former instrument theory examination (IREX) under Part 5 of the *Civil Aviation Regulations 1988 (CAR)*
- for operations wholly outside of controlled airspace (OCTA), the beyond visual light-of-sight exam under CASA 35/23[30]
- an alternate exam approved for this purpose under CASR 101.300 (4) (a) (iii).[31]

Note: Currently, BVLOS operations can only be conducted by CASA-approved operators on a case-by-case basis.

5.4 Logbooks

5.4.1 A RePL holder operating under a ReOC must keep a remote pilot log to record their accumulated flight time operating RPA.

5.4.2 The Part 101 MOS prescribes that the log record:

[27] The minimum requirement is for a Part 61 RPL theory examination. Converted RA-Aus RPL holders will need to meet the Part 61 standard.

[28] In accordance with regulation 101.295 of CASR.

[29] See CASA EX 27/23.

[30] https://www.casa.gov.au/drones/registration-and-flight-authorisations/beyond-visual-light-sight-exam.

[31] At the time of publication of this AC, there are no other approved examinations available.

- RPA details
- date, location and duration of each flight
- separate accumulated flight times for operations that are:
  - at night
  - within VLOS
  - within EVLOS
  - beyond VLOS
  - accumulated flight time in simulated operation of the RPAS, including details of the type of RPAS operations simulated.

5.4.3 An electronic logbook may be used, but it should include an auditing functionality that ensures the veracity and accuracy of the data entered.

5.4.4 A traditional pilot's logbook may be used and can be purchased from an aviation store and used as a permanent record of RPA flying hours. Remote pilot hours can be logged in a separate column in the traditional pilot's logbook, but traditional and RPA hours cannot be aggregated.

5.5 RePL permissions

5.5.1 A RePL is issued with certain authorisations endorsed on it, depending on:

- the RPA type and category the person has qualified to fly
- the operations that the remote pilot plans to conduct.

5.5.2 To ensure that the remote pilot is competent to operate different types of RPA, CASA requires pilots to undergo training and demonstrate competency in the RPA category and type that they will fly.[32] For RPA weighing less than 25 kg, a generic grouping is endorsed on the RePL (e.g., multi-rotor, < 7 kg; aeroplane, < 25 kg).

5.5.3 As indicated previously, in the interests of aviation safety, CASA may limit some RePL holders to operations with RPA weighing less than 7 kg.

5.5.4 RPAS that weigh more than 25 kg are treated as individual qualifications and must be listed on the RePL by the name and maximum take-off weight.

RePL upgrade training

5.5.5 RePL upgrade training is required to fly RPA in a different category or type. This training can be conducted by a CASA approved RePL training organisation. Not all training providers conduct RePL upgrade training. See the CASA website to locate a list of RePL training providers.

5.5.6 Operational approvals

5.5.6.1 RePL holders may be eligible to conduct a range of operations, depending on the conditions on their licence. Other operations outside of the general operating conditions (see paragraph 3.1.1) may be conducted provided:

- ReOC holders have obtained the correct authorisation
- there are suitable procedures in their approved Operations Manual
- remote pilots have achieved competency under the operator's training program relevant to the operation to be flown.

[32] In accordance with subregulation 101.295 (2) of CASR.

5.5.6.2 Normally, operational approvals will be issued to ReOC holders who will ensure that their remote pilots are suitably trained to operate under the conditions of the approval.

5.5.6.3 Some approvals relate to a design feature of the RPAS. These are:

- automated flight (usually issued with the initial RePL, as required)
- manual flight (usually issued with the initial RePL, as required)
- liquid-fuel propulsion for aircraft over 25 kg gross weight.

5.5.6.4 Applicants for these types of approvals may need to demonstrate their knowledge and practical skills in a flight test, noting that CASA may ask an applicant to meet other requirements as a condition of the approval (e.g., knowledge of an operator's procedures for carrying out the type of flight activity proposed).

5.5.6.5 All approvals can be issued with the initial RePL or added later.

Note: Ongoing approvals for airspace and aerodrome activities will not be issued until standards for aeronautical knowledge examinations on these topics are published in the proposed Part 101 MOS.

5.6 Aeronautical radio

5.6.1 Where an operation requires use of an aeronautical radio the remote pilot must ensure they are suitably qualified prior to commencing the operation.

5.6.2 Transmission on an aeronautical radio is prohibited unless the person operating the radio holds one of the following qualifications:

a. an aeronautical radio operator certificate

b. a flight crew licence

c. an air traffic control licence

d. a military qualification equivalent to a licence mentioned in paragraph (b) or (c)

e. a flight service licence.

5.7 Flight proficiency and currency

5.7.1 There are no CASA requirements for continuing flight proficiency or currency for RePL holders. However, remote pilots should maintain their proficiency and currency through regular practice, which may consist of RPA flying supplemented by computer-based simulator time.

5.7.2 Lack of proficiency or currency that led to an accident or incident might later be determined to be hazardous operation[33] if it was reasonable to assume that the RPA could have been competently controlled in the circumstance by a remote pilot of higher proficiency or with more currency.

5.7.3 ReOC holders should include proficiency and currency requirements in their documented practices and procedures for all personnel undertaking duties essential to the safe operation of the company's RPAS.

[33] Regulation 101.055 of CASR.

6 Registration of RPA and aircraft requirements

6.1 Registration of RPA

6.1.1 All RPA operated under a ReOC, no matter how much it weighs, must be registered with CASA, unless the RPA is operated for the purposes of a test flight, in accordance with Chapter 11 of the Part 101 MOS. Large RPA registration requirements differ and are further detailed in chapter 7 of this AC.

6.1.2 RPA are registered online through the myCASA portal.

6.1.3 Registration is valid for 12 months unless cancelled sooner.

6.1.4 An electronic or hard copy of the registration certificate must be carried by the person flying the aircraft during operations and produced to an authorised person on demand. It is an offence to operate an RPA that is not registered for commercial purposes.

6.1.5 Should a registered RPA be taken overseas for the purposes of operation, it would need to be marked with the Australian nationality mark (VH-) followed by the registered serial number and the remote pilot must comply fully with the rules of that country[34]. See section 3.1.16 for further information on ReOC operations with Australian registered RPA outside of Australian territory. Excluded RPA cannot be operated outside of Australian territory.

6.1.6 An RPA must be de-registered if lost, damaged beyond repair, or sold or disposed of. This is done online through the myCASA portal. In the event the RPA is sold, the registration number should not be removed. After the RPA has been deregistered, the new owner will be able to register it.

Modifications and registration

6.1.7 To some extent, the regulations permit the original registration to continue even when an RPA is modified. This is to allow development of the RPA without requiring the RPA to be re-registered.

6.1.8 The registration may continue, provided the modifications do not:

- change the category of the RPA (aeroplane, multi-rotor, powered lift etc.)
- increase the weight classification of the RPA into a higher weight classification (i.e., very small RPA to small RPA)
- increase the gross weight on take-off of the RPA by more than 20% (take-off weight includes payload)
- involve removal of parts and components that are critical to the flight of the RPA
- alter any of the following for the RPA:
  - the manufacturer's serial number
  - the CASA registration number allocated in substitution for a manufacturer's serial number
  - any electronic identification of the RPA.

[34] Note that it is a requirement of the Convention on International Civil Aviation that a remotely piloted aircraft operated over the territory of another ICAO State (another country) must be authorised by that State.

6.2 Aircraft identification

6.2.1 Aircraft operated under a ReOC must legibly display the manufacturer's serial number, or if there is no manufacturer's serial number, the mark allocated by CASA when the aircraft was registered.

6.2.2 It is acceptable if the manufacturer's serial number is displayed on a surface that is not exposed in flight, such as inside a battery box, or under an easily removeable hatch.

6.2.3 Any identification only need be in place during flight time, but operators should have a system of identification for their aircraft to ensure that they are safely managed, particularly with respect to maintenance.

6.2.4 Operators must also retain the aircraft's electronic identification, as allocated by the manufacturer, in such a way that is not changed, masked or interfered with in any way without the written permissions of CASA.

6.3 Foreign registered RPA and model aircraft

6.3.1 A person operating certain RPA and model aircraft that is registered under a law of a foreign country, but not registered in Australia, must comply with the following operation requirements:[35]

- has applied to CASA for permission to operate the aircraft, in accordance with the approved form for such applications
- paid the fee for such a permission
- have obtained the written permission of CASA and that permission has not expired, been revoked and the remotely piloted aircraft is not subject to an unacceptable modification
- operates in accordance with any conditions (if any) in the permission
- complies with the limitations and restrictions on the operation of a remotely piloted aircraft set out in the Australian civil aviation legislation
- when operating the remotely piloted aircraft, produces the permission, along with photographic identification, on request by an officer of CASA, or of an Australian police service.

6.3.2 CASA will revoke such permissions if it considers the revocation is necessary in the interests of aviation safety.

Modification of foreign registered RPA and model aircraft

6.3.3 Where a permission has been granted in respect of foreign RPA and model aircraft, and the aircraft has undergone an unacceptable modification since the permission was granted, CASA may revoke the permission.

6.3.4 In respect of modifications, a permission granted remains valid, provided any modifications do not:

- change the category of the aircraft (aeroplane, rotorcraft, airship etc.)
- increase the weight classification of the aircraft into another classification (very small RPA, small RPA etc.)
- increase the gross weight on take-off of the aircraft by more than 20% (take-off weight includes payload)
- involve removal of parts and components that are critical to the flight of the aircraft

[35] See Part 47 of CASR and Chapter 13 of the Part 101 MOS for applicability.

- alter any of the following for the aircraft:
  - the manufacturer's serial number
  - the CASA serial number allocated in substitution for a manufacturer's serial number
  - any electronic identification of the aircraft.

6.4 Registration and marking of large RPA

6.4.1 Registration

6.4.1.1 CASA requires that the operator of a large RPA must register their aircraft under Part 47 of CASR. This applies to both experimental certificate and restricted category aircraft. See the CASA website for information on registering an aircraft.

6.4.2 Marking

6.4.2.1 All Australian aircraft must comply with the aircraft marking requirements of Part 45 of CASR. As RPA may not be able to comply with standard marking requirements, regulation 45.065 of CASR allows that a person can apply to CASA for approval for the RPA to operate with different markings. CASA and the applicant will work together to determine appropriate alternative marking requirements.

6.4.2.2 Subsection 45.120 (c) of CASR exempts aircraft with a maximum take-off weight of up to 5,700 kg operating inside Australian territory from carrying an aircraft registration identification plate if it has a manufacturer's data plate attached.

7 Airworthiness

7.1 Person responsible for continuing airworthiness

7.1.1 Flying without satisfying safety requirements

7.1.1.1 All RPA operate under subsection 20AA (4) of *the Act* which requires that an owner, operator, hirer (other than the Crown) or a pilot of an Australian aircraft must not commence a flight in the aircraft, or permit a flight in the aircraft to commence, if one or more of the following apply:

- there is an outstanding requirement imposed by or under the regulations in relation to the maintenance of the aircraft
- the aircraft will require maintenance before the flight can end
- there is a defect or damage that may endanger the safety of the aircraft or any person or property.

7.1.1.2 In practical terms, the operational risk assessment will inform decisions by the RPA operator for determining appropriate continuing airworthiness risk mitigations.

7.1.2 RPA Operator (ReOC holder)

7.1.2.1 Ultimately, the RPA operator is responsible for ensuring continuing airworthiness. All ReOC holders must nominate a Maintenance Controller (MC). Refer to sections 4.2.3 and 7.1.3 of this AC for details.

7.1.2.2 In addition, Registered Operators (RO) of large RPA are required to ensure that aircraft being used in their operations are maintained in accordance with the applicable sections of Parts 4A and 4D of the *Civil Aviation Regulations 1988* (CAR) and they are in a condition for safe operation.

7.1.3 Maintenance controller

7.1.3.1 The maintenance controller (MC) is responsible for ensuring that the RPA operated under the ReOC are serviceable. This includes ensuring maintenance is carried out by competent personnel, record keeping, essential equipment checks and defect investigation. Specific details of the legislated functions and duties of a MC can be found in AC 101-05 - Functions and duties of RPAS maintenance controllers.

7.2 Certificates of Airworthiness (CoA)

7.2.1 Requirements for Large RPA

7.2.1.1 Large RPA are required under CASR to have either an experimental certificate or a restricted category certificate of airworthiness (CofA). Refer to subregulation 101.255 (1) of CASR; a person may only operate a large RPA if a special certificate of airworthiness has been issued under Subpart 21.H.

7.2.1.2 Special certificates of airworthiness are issued to permit the operation of aircraft that do not meet the requirements of the Annex 8, Airworthiness of Aircraft to the Chicago Convention, but are capable of safe operations under defined operating conditions and purposes. These conditions will be specified on the certificate.

7.2.2 Experimental certificates

7.2.2.1 Regulation 21.191 lists the purposes for which an experimental certificate may be issued. For more information on experimental certificates, please see AC 21-10 - Experimental certificates.

> **Note:** An experimental certificate is generally limited in duration and is not intended to be used as a permanent operating category for commercial operations.

7.2.3 Restricted certificate of airworthiness

7.2.3.1 For an RPAS to be issued a restricted CofA, the aircraft must have been type certificated in the restricted category. An RPAS that has been type certificated in the restricted category is entitled to a special certificate of airworthiness in the restricted category subject to the requirements specified in regulation 21.185 of CASR.

7.2.3.2 Regulation 21.025 of CASR lists the purposes for which an applicant can apply for a type certificate for an aircraft in the restricted category. Under paragraph 21.025 (1) (a), an applicant is entitled to a type certificate in the restricted category for one of those purposes if the aircraft:

- can reasonably be expected to be safe for its intended use when it is operated under the conditions limiting its intended use
  - the aircraft either:
    - » meets the airworthiness requirements of the normal, utility, acrobatic, commuter or transport category, except those requirements that CASA considers are inappropriate for the special purpose for which the aircraft is to be used

  or
    - » is of a type that has been manufactured in accordance with the requirements of, and accepted for use by, the Defence Force, or an armed force of Canada, the United Kingdom, or the United States of America, and has been later modified for the special purpose operation or operations.

7.3 Maintenance Requirements for Large RPA

7.3.1 Requirements

7.3.1.1 Large RPA must be maintained in accordance with Subdivision 2 of Division 2 of Part 4A of CAR. Aircraft must be maintained in accordance with the applicable maintenance schedule. Experimental aircraft must also be maintained in accordance with any conditions noted on the experimental certificate.

7.3.1.2 Aircraft must also be maintained in accordance with approved maintenance data, also referred to as Instructions for Continuing Airworthiness (ICA). The manufacturer's maintenance data is considered the fundamental set of instructions for maintaining the aircraft type.

7.3.1.3 All aircraft must have a system for maintenance certification, such as via a Maintenance Release (MR). All maintenance must be certified as complete for the aircraft to be released to service. The RO is responsible for ensuring the aircraft is not operated before all the required maintenance is carried out and the aircraft is released to service.

7.3.2 Authorised Maintenance Personnel

7.3.2.1 Personnel performing maintenance on a large RPA will require a maintenance authority to certify that maintenance under CAR 33B. Applications for maintenance authorities

(maintenance permissions) are made to CASA with reference to CAO 100.24 which sets out maintenance competency requirements for approval of the application.

7.3.2.2 For unique or novel operations of large RPA, CASA recommends organisations contact CASA during the operational application process to determine the scope of the proposed operation. This may help inform proportionate maintenance/personnel requirements, noting that for RPA operations an appropriate risk assessment method is required, such as under SORA, for example.

7.3.2.3 A CASR Part 66 aircraft maintenance licence is the default requirement in Australia for the certification of aircraft maintenance and underpins the issue of maintenance permissions under CAO 100.24. However, for large RPA there is scalability available to recognise alternative competencies outside of the conventional Part 66 AME licence pathway. For a maintenance authority, all applicants must demonstrate appropriate competencies for that specific aircraft.

For large RPA, CASA can accept a Part 66 licence or alternative means of establishing competencies such as RPA manufacturer training courses, formal maintenance training, foreign or military RPA maintenance permissions, coupled with appropriate large RPA maintenance experience in the context of the intended large RPA operations, as assessed by CASA.

It is also expected that the applicant's competency remains current and that this is demonstrated by the applicant.

Appendix A
Part 101 MOS no-fly zones and approach and departure paths for aerodromes

A.1 Non-controlled aerodrome no-fly zone and approach and departure paths

A.1.1 Figure 3 shows the no-fly zone of a non-controlled aerodrome.

A.1.2 The no-fly zone of a non-controlled aerodrome is any area:

a. within 3 NM, in any direction, from the measurement point of any runway of a non-controlled aerodrome (the area shaded grey)

or

b. within the areas shaded black.

A.1.3 The approach and departure paths of a non-controlled aerodrome is:

a. from the surface to 400 ft within the areas shaded black

b. from 150 ft to 400 ft within the area shaded grey.

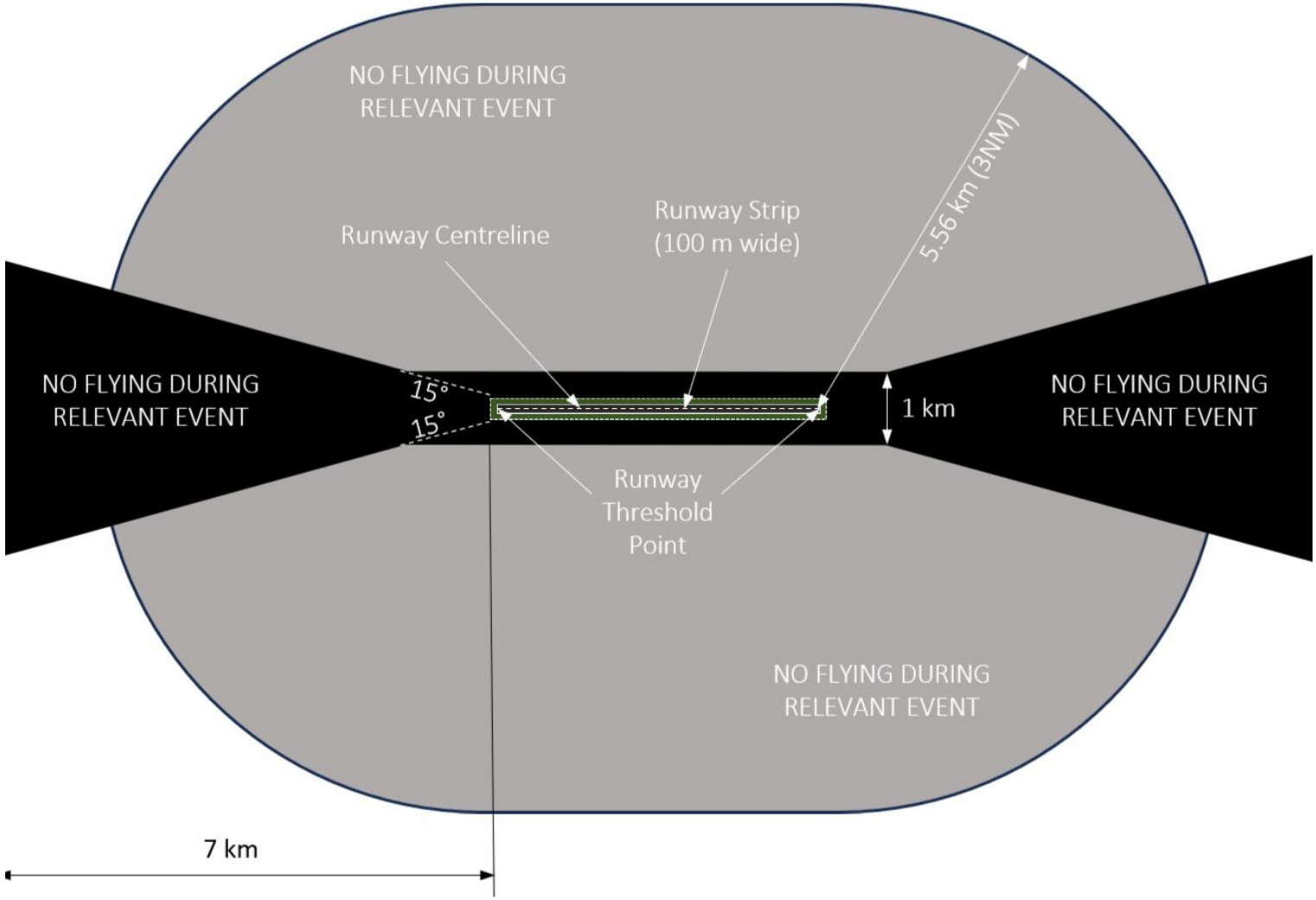

Figure 3: Non-controlled aerodromes approach and departure paths

A.1.4 Multiple or cross runways

A.1.4.1 Figure 4 depicts the application of the no-fly and restricted height zones to multiple or cross runways.

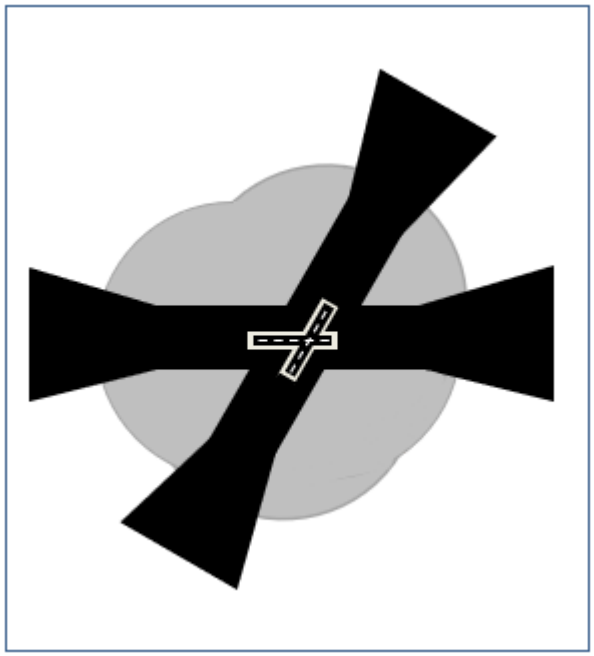

Figure 4: Example for cross runways

A.2 Helicopter landing site no-fly zone

A.2.1 Figure 5 depicts the no-fly zone of an HLS.

A.2.2 The no-fly zone of a HLS is any area from the surface to 400 ft within 0.75 NM (1.389 km) in any direction of the centre of the HLS.

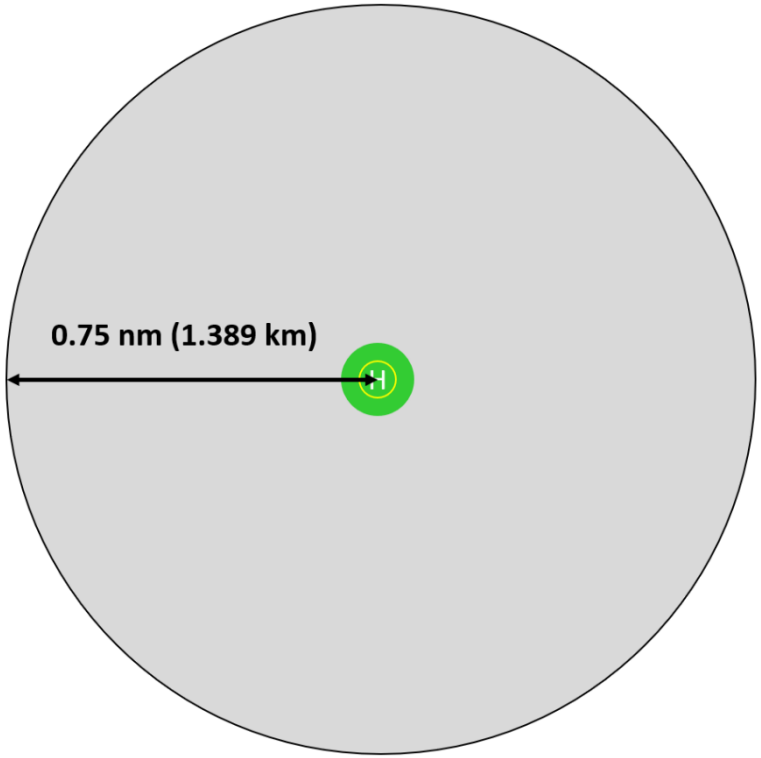

Figure 5: HLS no-fly zone

Appendix B
Instructions for obtaining an aviation reference number (ARN)

B.1 Applying for an Aviation Reference Number (ARN)

B.1.1 An ARN is a unique identifier, like an account number or customer number and it should be quoted whenever contacting CASA. The number on an authorisation (e.g., licence or certificate) is, in most cases, the ARN belonging to the entity (individual or corporation) that holds that authorisation.

B.1.2 If an individual holds or once held a CASA issued pilot, air traffic or airworthiness engineer licence they will already have an ARN. If such a licence is obtained in the future, the ARN will be retained.

B.1.3 An ARN should be applied for online using the myCASA portal. Information on applying for an individual aviation reference number is available via the CASA website.

B.1.4 RePLs and RPA authorisations can only be issued to an ARN that is held by an individual. RPA registration can be issued to an ARN that is for an individual or corporation (company etc.). An organisational ARN should be applied for through the myCASA portal. Before applying for an organisation ARN, the authorised representative of the organisation will need to obtain an individual ARN. Information on applying for an organisational ARN